

## THE NATIONAL COMMISSION FOR NUCLEAR ACTIVITIES CONTROL

### Regulation on specific requirements for decommissioning of nuclear and radiological facilities

#### CHAPTER I GENERAL REQUIREMENTS

##### Scope, definitions and objective

**Art. 1.** - This regulation establishes the specific requirements and the licensing requirements for decommissioning of nuclear and radiological facilities.

**Art. 2. - (1)** This regulation shall apply to the decommissioning of a facility or part of a facility in state:

- a) at the end of the design life of a facility;
- b) after a premature shutdown of a facility
- c) after an accident has occurred or a situation has arisen that has resulted in serious damage to, or the contamination of a facility.

**(2)** This regulation contains requirements for preparing for decommissioning during design, planning, siting, and operation of a facility.

**Art. 3.** - This regulation shall apply to the decommissioning of the following nuclear and radiological facilities:

- a) nuclear power plants;
- b) research reactors;
- c) predisposal waste management facilities;
- d) relevant medical, industrial, research and development radiological facilities;
- e) auxiliary buildings and services associated to radioactive waste disposal facilities.

**Art. 4.** - This regulation does not apply to:

- a) the uranium and thorium mining and milling facilities and fuel fabrication;
- b) the remediation of areas contaminated by residual radioactive material arising from past activities that were never subject to regulatory control;

- c) the remediation of areas outside of a facility affected by a nuclear or radiological emergency after the emergency has been declared to be over;
- d) the management of fresh and spent nuclear fuel, as well as the management of radioactive waste as generated during the operation phase.

**Art. 5** - The aspects on non-radiological risk associated to the decommissioning activity are not the subject of this regulation.

**Art. 6** - For the purpose of this regulation, in addition to the terms defined in Law no. 111/1996 on the Safe Development, Regulation, Licensing and Control of Nuclear Activities, republished, with subsequent amendments and completions, and in CNCAN Order no. 14/2000 approving the Fundamental Regulation on Radiological Safety, as well as in CNCAN Order no. 56/2004 approving the Fundamental Regulation on the Safe Management of Radioactive Waste and Spent Nuclear Fuel, republished, the other terms, definitions and abbreviations used herein are defined in Annex 1 which is integral part of this regulation.

## CHAPTER II

### REQUIREMENTS ON RADIOLOGICAL PROTECTION

#### Section 1

##### Exposure during decommissioning

**Art. 7** - For the decommissioning activity, the radiological safety requirements according to CNCAN Order no. 14/2000 approving the Fundamental Regulation on Radiological Safety.

**Art. 8** - The radiation protection of persons who are exposed as a result of decommissioning shall be optimized according to the dose constraint established by CNCAN.

#### Section 2

##### Graded approach

**Art. 9** - (1) The decommissioning activity and the associated documents shall be carried out and prepared, respectively, in accordance with the graded approach.

(2) The licensee shall document the graded approach concept used for all aspects of decommissioning and shall demonstrate that the level of analysis, documentation, and actions implemented to comply with a requirement in this regulation are commensurate with:

- a) The magnitude of the probability and consequences of any hazard, radiological and non radiological, involved relative to safety, safeguards and security;

- b) The lifecycle stage of a facility, status, and condition of facility;
- c) The complexity of a facility;
- d) The particular characteristics of a facility;
- e) Any other relevant factors.

### Section 3

#### Discharges and their control during decommissioning activity

**Art. 10. - (1)** The licensee shall assess the radiological impact of radioactive discharges resulted from the decommissioning activity.

**(2)** The assessment of the radiological impact of radioactive discharges into the environment is part of the final decommissioning plan.

**Art. 11. - (1)** The licensee shall establish annual derived emission limits for radioactive liquid discharges and gaseous discharges, resulted from the decommissioning activity, ensuring the observance of the effective dose constrains established by CNCAN.

**(2)** The establishment of the derived emission limits for radioactive effluents into the environment shall be done according to the specific regulations issued by CNCAN.

**(3)** The licensee shall reassess whenever necessary depending on the progress of the decommissioning activity, the impact of the radioactive discharges into the environment and the associated control measures.

**Art. 12. - (1)** The licensee shall establish and implement the programmes for monitoring of radioactive discharges and environmental radioactivity around the facility.

**(2)** The monitoring programme of the radioactive discharges into the environment shall be established according to the specific regulations issued by CNCAN.

**Art. 13. -** In the case when the end state of the facility, as it is described in final decommissioning plan, is the release from regulatory control with restriction of use of the facility or site, the licensee shall develop and implement an appropriate surveillance and monitoring programme for the period of restriction, as approved by CNCAN.

**Art. 14. -** The license shall assign clear responsibilities for implementing and maintaining the programmes for surveillance and monitoring to ensure compliance with the restrictions on the future use of the facility and/or the site.

**Art. 15. -** In the case when the deferred dismantling strategy is selected, according to the provisions included in Chapter IV of this regulation, the licensee shall ensure that a corresponding programme for monitoring and surveillance is established and implemented throughout the period of deferral.

**Art. 16. - (1)** For new facilities, the licensee shall perform a background radiological survey of the site

at siting stage.

(2) The background radiological survey shall be updated prior to commissioning of the facility.

(3) For existing facilities for which no such background radiological survey has been made in the past, the licensee may use data from analogous and undisturbed areas with similar characteristics shall be used instead of siting baseline data.

(4) The radiological characterization data shall be used as reference to establish the end state and the impact of decommissioning activity on the environment.

#### **Section 4**

##### **Release from the regulatory control**

**Art. 17. - (1)** The licensee shall declare in the decommissioning plan the clearance levels used, in accordance with specific regulations issued by CNCAN.

(2) In the final decommissioning plan, the licensee shall describe all provisions to ensure that the radioactive material to be released from the regulatory control complies with the clearance levels or the derived criteria approved by CNCAN.

**Art. 18. -** The licensee shall establish and implement specific arrangements for controlling the clearance of material and shall ensure their implementation during the decommissioning activity in accordance with CNCAN approval.

#### **Section 5**

##### **End state criteria**

**Art. 19. -** After the decommissioning of the nuclear or radiological facility, the end state of the site can be the unrestricted release or the release with restricted use.

**Art. 20. -** Notwithstanding the limits provided in art.21 and art.22, for the end state of the site, the effective dose additional to the natural background level for a representative person shall be maintained at the lowest reasonable level.

**Art. 21. - (1)** For the unrestricted release of the site from the regulatory regime, the maximum limit of the effective dose may not exceed 0.25 mSv/year above the natural background for a representative person.

(2) For decommissioning involving multiple facilities, the dose criterion shall be allocated for each facility as a fraction of 0.25 mSv/year above natural background, so that the cumulative dose does not exceed 0.25 mSv/year above natural background.

**Art. 22. -** The criterion for restricted use of the site is the same as for unrestrictive release, with exception that, if the restriction fails, the dose may exceed the criterion for unrestrictive release, but

may not exceed 1 mSv/year above background.

**Art. 23.** - The approval of the release with restricted use of the site will be granted by CNCAN only if arrangements for implementation of the restrictions are in place and these can be legally imposed.

## CHAPTER III

### REQUIREMENTS ON THE MANAGEMENT OF DECOMMISSIONING

#### Section 1

##### Responsibilities of the licensee for decommissioning

**Art. 24.** - The licensee shall be responsible for all aspects of radiological safety during the performance of decommissioning activity.

#### Section 2

##### Integrated management system for decommissioning

**Art. 25.** - (1) The licensee shall establish and implement the integrated management system and shall continuously improve it by considering the changes during the performance of decommissioning activity.

(2) The integrated management system shall fulfil the requirements provided in this regulation.

(3) The management system shall integrate the structures, resources and the processes of the organization to fulfil the related objectives for radiological safety, health, environment, security, quality and economic matters and other considerations.

(4) The main aim of the management system shall be to achieve and enhance safety by:

- a) Bringing together in a coherent manner all the requirements for managing the organization;
- b) Describing the planned and systematic actions necessary to provide adequate confidence that all these requirements are satisfied;

(5) For the nuclear facilities, the quality management system shall comply with the specific regulations issued by CNCAN and shall be licensed according to the law.

(6) For radiological facilities, the quality management system shall comply with the requirements provided in the standards agreed by CNCAN.

**Art. 26.** - The integrated management system shall enable the planning and implementation of decommissioning actions with the prime goal of ensuring that decommissioning is conducted safely.

**Art. 27.** - (1) The licensee can delegate the performance of specified tasks to subcontractors.

(2) The licensee shall ensure that the work of subcontractors is appropriately controlled so that it is conducted safely.

(3) In relation with the outside organisations and subcontractors, the licensee shall ensure that there is a clear allocation of responsibilities, interfaces and communication routes.

**Art. 28.** - To fulfil its prime responsibility for radiological safety during decommissioning activity, the licensee shall establish and implement radiological safety policies and shall ensure that safety aspects are given the highest priority.

**Art. 29.** - The licensee shall establish an organizational structure for the management and implementation of decommissioning activity, with the responsibility to ensure that decommissioning activity will be conducted safely.

**Art. 30.** - (1) The licensee shall ensure that adequate knowledge of the facility and technical expertise is available during the life time of the facility.

(2) The licensee shall use in the decommissioning activity the knowledge and information accumulated during the entire lifetime of the facility.

**Art. 31.** - (1) The licensee shall:

- a) identify the processes of the management system that are needed to achieve the goals,
- b) provide the means to meet all requirements
- c) deliver the required results of the organization.

(2) The work performed in each process shall be carried out under controlled conditions, by using approved current procedures, instructions, drawings or other appropriate means that are periodically reviewed to ensure their adequacy and effectiveness.

**Art. 32.** - (1) The transfer of responsibility for decommissioning shall be licensed according to Law no. 111/1996.

(2) In case of licensee change, during the lifetime of the facility, procedures shall be put in place to ensure the proper transfer of responsibility for decommissioning to the new licensee.

**Art. 33.** - The licensee shall ensure that the documentation of the management system includes at least the following:

- a) the organization policy;
- b) the description of the management system;
- c) the description of the organizational structure;
- d) the description of the accountabilities, levels of authority and interactions of those managing, performing and assessing works;
- e) the description of the interactions with relevant outside organizations;

- f) the description of the processes and supporting information that explain how work is to be prepared, reviewed, carried out, recorded, assessed and improved.

### **Section 3**

#### **Safety culture**

**Art. 34. - (1)** The licensee shall have in place a programme to promote and maintain a safety culture in the organization.

**(2)** The programme mentioned in paragraph (1) shall include, as a minimum, the issues provided in Annex 2.

### **Section 4**

#### **Human factors**

**Art. 35. -** The licensee shall evaluate the skills needed for safe decommissioning and shall determine the minimum number and qualification requirements of staff responsible for ensuring the radiological safety.

**Art. 36. -** The licensee shall establish, periodically update and implement training programmes for staff in order to be able to manage new situations of the decommissioning activity.

### **Section 5**

#### **Record keeping system**

**Art. 37. - (1)** On the entire life time of the facility, the licensee shall establish, implement and archive the relevant records which need to be retrievable within reasonable timeframe.

**(2)** The relevant records shall be used developing the decommissioning plan, its subsequent revisions as well as for the elaboration of the final decommissioning report.

**Art. 38. -** The licensee shall identify and shall include into the decommissioning plan the records on the design and design modification as well as the records on the operating history.

**Art. 39. -** The licensee shall establish, implement and maintain up to date a record keeping system of the quantities, types, characteristics and management methods of the material and waste generated, stored in the facility, or transferred to another authorized facility, including those that were cleared according to art. 18.

**Art. 40. -** The licensee shall establish and implement a record keeping system which support the release of the facility from regulatory control and which shall including at least:

- a) nature and levels of residual radioactivity;

- b) decisions made and their rationale before and after decommissioning of the facility;
- c) information that verify that the end state as defined within the final decommissioning plan has been reached;
- d) the conditions that apply in the case of release from regulatory control with restriction according to art.13.

**Art. 41. - (1)** All records on the decommissioning activity are permanent records and they shall be kept according to the provisions of integrated management system.

**(2)** The integrated management system shall stipulate the way to inform the new users of the site about the presence of the facility on the site and about the nature of the activities conducted in the past.

## **Section 6**

### **Reporting requirements to CNCAN**

**Art. 42. - (1)** The licensee shall establish, implement and maintain a reporting system to CNCAN.

**(2)** The related procedures of the reporting system shall be approved by CNCAN.

**Art. 43. -** The licensees shall annually report to CNCAN:

- a) The progresses in performance the decommissioning activity;
- b) The inventory of radioactive and nonradioactive waste generated from decommissioning;
- c) The summary of the monitoring results of exposure of worker and the public;
- d) The status of financial resources used and the availability of the funds for next phases.

## **CHAPTER IV**

### **REQUIREMENTS ON DECOMMISSIONING STRATEGY**

#### **Selecting a decommissioning strategy**

**Art. 44. - (1)** The licensee shall establish the decommissioning strategy for the facility.

**(2)** The decommissioning strategy is one of following:

- a) Strategy with immediate dismantling;
- b) Strategy with deferred dismantling.

**(3)** The decommissioning strategy shall be consistent with the national policies and strategies in nuclear field.

**Art. 45. -** Under exceptional circumstances, following a severe accident by exception of the strategies



mentioned above in art. 44 paragraph (2), entombment may be considered as decommissioning strategy.

**Art 46. - (1)** The licensee shall consider the strategy with immediate dismantling and shall elaborate the initial decommissioning plan and subsequent revisions considering this strategy.

**(2)** By exception from paragraph (1) above, the licensee may consider the strategy with deferred dismantling on the basis of radiological safety requirements, technical conditions, disposal/treatment and conditioning/storage availability or financial considerations.

**(3)** In special circumstances a combination of these two strategies mentioned above in art. 44 paragraph (2) shall be considered.

**Art. 47. - (1)** The licensee shall justify any other strategy selected for decommissioning, except the immediate dismantling strategy.

**(2)** The justification shall contain the reasons for that the preferred strategy is not the immediate dismantling strategy, description of the selected option, overall timescales and phases of the decommissioning activities, and the end-state after completion of all decommissioning activities.

**Art. 48. -** The licensee shall demonstrate that, under the strategy selected, the facility will be maintained in a safe configuration at all times and it will reach the specified decommissioning end state.

**Art. 49. - (1)** For unplanned situations, when the facility shall be in a premature shutdown, the licensee shall assess the situation that initiated the premature shutdown and, if the case, shall review the decommissioning strategy.

**(2)** If shutdown is caused by an accident, the facility shall be brought to a safe configuration before a decommissioning strategy will be defined.

**Art. 50. -** For sites with more than one facility, having the same licensee or different licensees, a site strategy for decommissioning shall be developed in order to ensure that interdependences between the facilities are taken into account in the planning of activities for each facility.

## **CHAPTER V**

### **REQUIREMENTS ON FINANCING THE DECOMMISSIONING ACTIVITY**

#### **Ensuring the financial resources for decommissioning**

**Art. 51. - (1)** The licensee shall estimate the costs of transition activities from the operation phase to the decommissioning phase for maintaining the facility in safe conditions and the costs for decommissioning activity and shall provide financial assurances to cover the associated costs, including costs for the management of the resulting radioactive material and waste.

(2) The licensee shall update the estimated costs for decommissioning on the basis of the periodic review of the initial decommissioning plan or on the basis of the final decommissioning plan.

**Art. 52. - (1)** The licensee shall ensure that the adequate financial resources necessary to cover the costs related to the safe deployment of decommissioning activity and for the management of generated radioactive waste, are available when necessary.

(2) The financial resources for decommissioning of the facility and for the management of generated radioactive waste shall be consistent with the costs estimate and shall be updated if necessary.

**Art. 53. -** For existing facilities for which financial resources for the decommissioning have not been established, the licensee shall demonstrate that financial resources for decommissioning are in place when a renewal or extension of the licence is requested.

**Art. 54. -** In the event of a premature shutdown of the facility, the licensee shall ensure that the financial resources for carrying-out the decommissioning activities are available, when they are needed.

**Art. 55. -** If the decommissioned facility is to be released from the regulatory regime with restrictions on its future use, the licensee shall made available financial resources for monitoring, surveillance and control of the facility throughout the restriction period.

## **CHAPTER VI**

### **REQUIREMENTS ON PLANNING THE DECOMMISSIONING**

#### **Section 1**

##### **Planning for decommissioning**

**Art. 56. -** The licensee shall take into consideration the decommissioning in the siting, design, construction, commissioning, operation and any major modification of the facility so that to facilitate decommissioning activities, to keep the records of the facility, to limit contamination and activation and to avoid waste accumulation.

**Art. 57. - (1)** Based on the selected decommissioning strategy, the licensee shall develop an initial decommissioning plan for the facility.

(2) The details of the plan shall be commensurate with the type and status of the facility.

**Art. 58. -** This initial decommissioning plan shall:

- a) identify the decommissioning option;
- b) demonstrate the feasibility of decommissioning and that decommissioning can be safely carried out;
- c) confirm that sufficient and adequate financial resources will be available for decommissioning;

d) identify categories and estimate quantities of radioactive waste that will be generated during decommissioning;

e) confirm environmental protection.

**Art. 59. - (1)** The licensee shall submit to CNCAN, the initial decommissioning plan together with the application for authorization of construction of the facility.

**(2)** The licensee shall submit to CNCAN any revision of the initial decommissioning plan in order to be reviewed and accepted.

**(3)** For existing facilities where there is no an initial decommissioning plan, in maximum 2 (two) years from the entry in force of this regulation, the licensee shall develop and submit to CNCAN the initial decommissioning plan.

**Art. 60. -** Every 5 (five) years, the licensee shall update and detail the initial decommissioning plan considering aspects that include: major modifications in the facility, operating experience, regulatory requirements, advances in technique and technology and updating the decommissioning costs or experience from similar decommissioning activities, including the occurrence of incidents or events with radiological consequences relevant for decommissioning, if the case may be.

**Art. 61. -** The licensee shall identify in the decommissioning plan, the existing systems and equipment that will be used during decommissioning and shall ensure that they are available when necessary.

**Art. 62. -** The licensee shall identify and shall include in the decommissioning plan the necessary changes or modifications of the existing systems which are needed during decommissioning.

**Art. 63. -** The licensee shall identify in the decommissioning plan, the equipment and means specific for the decommissioning activity other than those existing in the facility which are necessary during the decommissioning, as well as those needed for the management of radioactive waste as generated during the decommissioning.

**Art. 64. -** For sites with more than one facility, the licensee of each facility shall ensure that any interactions and interdependencies between the facilities which affect the decommissioning activities or influence the activities of the other facilities are considered in the decommissioning plan.

## Section 2

### Permanent shutdown

**Art. 65. -** At least 2 (two) years prior to the permanent shutdown, the licensee shall notify CNCAN of its intention.

**Art. 66. - (1)** Within 2 (two) years from the notification for the permanent shutdown of the facility, the licensee shall submit to CNCAN for approval the final decommissioning plan for the facility which is permanently shut down, except when the shutdown is due to an accident when the timeframe for submitting the final decommissioning plan depends on the status of the facility and the complexity of

the decommissioning activities.

(2) The provision of paragraph (1) applies also for facilities that were not in operation in the previous 2 (two) years and are not under refurbishment or maintenance or repairing.

### Section 3

#### Transition from operation phase to decommissioning phase

**Art. 67. - (1)** The transition period is part of the operating phase and it is covered by an operation licence until a decommissioning licence is issued.

(2) In the transition period from the operation phase to the decommissioning phase, the licensee shall maintain the facility in a safe configuration until obtaining the decommission licence.

**Art. 68. - (1)** In the transition period from the operation phase to the decommissioning phase, the licensee shall remove the operational radioactive waste and spent nuclear fuel which is present in the facility after its permanent shutdown.

(2) By exception from paragraph (1), in case the removal of operational waste and spent nuclear fuel is not possible, during the transition period, the licensee shall include in the final decommissioning plan their removal as part of decommissioning activity.

### Section 4

#### Final decommissioning plan

**Art. 69. - (1)** The final decommissioning plan shall:

- a) be consistent with the decommissioning strategy proposed for the facility;
- b) be consistent with the safety case for decommissioning;
- c) be complemented by a radiological safety assessment
- d) describe the decommissioning activities, the timeframe and the end-state of the decommissioning activity, the works to be carried-out during each decommissioning phase - if a phased approach is applied-, describe the facilities, systems and equipment needed to perform the decommissioning activities;
- e) describe the human resources required for safely conducting the decommissioning activities;
- f) describe the management of residual material and waste;
- g) describe principles of the management system used;
- h) describe the programme for the final radiological characterization after the end state of decommissioning.

(2) The content of the final decommissioning plan is presented in Annex 3 which is an integral part of this regulation.

**Art. 70. - (1)** In case of using phased approach, whenever necessary, the licensee shall update the final decommissioning plan, but at least before the beginning of each decommissioning phase.

(2) The updates of the final decommissioning plan shall reflect changes in the decommissioning strategy, deviations from the scheduled programme, lessons learned from ongoing decommissioning activities, changes of regulatory requirements, occurrence of incidents or situations which have consequences for the decommissioning activities.

**Art. 71. -** During the preparation and updating of the final decommissioning plan, the licensee shall determine the extent and type of radioactive material and waste existing in the facility by means of a detailed characterization survey and on the basis of records collected during the operation period.

## Section 5

### Radiological safety verification

**Art. 72. - (1)** The licensee shall develop a safety case documentation, which addresses all issues relevant for safety during decommissioning.

(2) The safety case documentation shall be used as the basis for assessing the safety implications of modifications in the facility and the changes in the decommissioning activities.

(3) The content of safety case documentation is provided in the Annex 4, which is an integral part of this regulation, and shall address at least:

- a) dynamic changes in the facility state;
- b) new or modified installations, systems and equipment;
- c) management of large quantities of radioactive material;
- d) conventional safety and radiation protection issues as results of demolition and dismantling as well as the unusual working environment.

(4) the safety case documentation shall be in accordance with the final decommissioning plan.

**Art. 73. - (1)** In supporting the final decommissioning plan, the licensee shall prepare a radiological safety assessment.

(2) The radiological safety assessment mentioned at paragraph (1) shall be elaborated in accordance with the specific regulations issued by CNCAN.

**Art. 74. -** The licensee shall review and update the safety case documentation to reflect the actual situation:

- a) before any major phase in the decommissioning activity, or
- b) when changes of the decommissioning plan are intended or changes of regulatory requirements or other issues relevant for safety have occurred.

**Art. 75. - (1)** Whenever necessary and accordingly to the provisions of the art. 80, in intervals no longer than ten years, the licensee shall assess the radiological safety of the facility under decommission.

(2) The review mentioned above in paragraph (1) shall be performed against the CNCAN requirements provided in regulations and in the limits and conditions for licensing and shall demonstrate the compliance with the planned decommissioning activities and with the regulatory requirements.

(3) The licensee shall identify and evaluate the safety significance of deviations from applicable current requirements and shall solve any deviation identified.

(4) The revision provided in paragraph (1) shall take into account the cumulative effects of changes of the procedures, modifications of the facility and of the decommissioning organization, technical developments, lessons learned during decommissioning, and ageing of SSCs.

(5) The licensee shall assess non radiological hazards, in this case the provisions of the paragraphs 1-4 shall be applied accordingly.

## Section 6

### Licensing of decommissioning activity

**Art. 76. -** The licensee shall submit to CNCAN the final decommissioning plan as a precondition for granting the decommissioning licence.

**Art. 77. - (1)** The decommissioning activity is licensed by CNCAN.

(2) The decommissioning activity could be licensed in phases by CNCAN.

(3) The decommissioning phases shall be described in the final decommissioning plan

(4) The technical documentation in support of application for decommissioning licence which has to be submitted by the licensee to CNCAN is mentioned in Annex 5 which is an integral part of this regulation

## CHAPTER VII

### REQUIREMENTS ON CONDUCTING THE DECOMMISSIONING ACTIVITIES

#### Section 1

### **Requirements on conducting the decommissioning activities**

**Art. 78.** - The licensee shall conduct the decommissioning activity in compliance with the decommissioning licence and with all other applicable requirements as provided by the national legislation.

**Art. 79. - (1)** In the case of decommissioning strategy with deferred dismantling, the licensee shall ensure that the facility is maintained in a safe condition throughout the period of deferral and, as far as it is reasonably practicable in safe passive configuration so that subsequent decontamination activities and/or dismantling can be safely performed.

**(2)** The licensee shall establish and implement programmes for maintenance, monitoring and surveillance programmes of safety conditions during the deferral period.

**(3)** The programmes provided under paragraph (2) shall be approved by CNCAN.

**Art. 80.** - The licensee shall demonstrate prior to their use that the technologies used in decommissioning are safe and can effectively lead to the desired result.

**Art. 81.** - The licensee shall select the decommissioning techniques and technologies in a such a manner that:

- a) radiation protection and radiological safety are optimized;
- b) environmental protection is ensured;
- c) the generation of radioactive waste is minimized
- d) any potential negative impact on the storage and disposal of radioactive waste is minimized.

**Art. 82. - (1)** With progress of the decommissioning activities, the licensee shall evaluate the importance of SSCs with respect to safety and classify them accordingly.

**(2)** The SSCs safety related shall be included in the safety case documentation.

**Art. 83. - (1)** The licensee shall prepare and implement documented programmes for maintenance, testing, surveillance and inspection of SSCs and of other equipment significant to safety to ensure that their availability, reliability and functionality remain in accordance with the safety case documentation for decommissioning.

**(2)** The programmes provided under paragraph (1) shall take into account the operational limits and conditions (OLCs) and shall be re-evaluated in the light of experience and the continuous changes of the facility during decommissioning activity.

**Art. 84.** - The licensee shall address the ageing of SSCs and other equipment significant to radiological safety and shall establish requirements for their maintenance, testing and inspection.

**Art. 85.** - The licensee shall record, store, analyse and review data on maintenance, testing, surveillance, inspection of SSCs as well as of and other equipment relevant for radiological safety, and if necessary corrective measures shall be implemented.



**Art. 86. - (1)** Before the beginning of any decommissioning action the licensee shall assess its impact on radiological safety and shall be subject to internal approval, according to the provisions from art. 26.

**(2)** The impact assessment shall take into account the postulated initiating events with external and internal causes.

**(3)** The postulated initiating events with external and internal causes are presented in Annex 6 which is an integral part of this regulation.

**(4)** The licensee shall consider the adverse effect of decommissioning actions which are performed in parallel against the radiological safety.

**Art. 87. -** The licensee shall control modifications of planned decommissioning actions according to their safety significance thereby ensuring that they do not compromise safety.

## **Section 2**

### **Decommissioning experience feedback**

**Art. 88. -** The licensee shall establish and implement arrangements for using the experience feedback, to collect, screen, analyse and document experience and events at its own facility and from other relevant facilities, in a systematic way to improve and ensure safe decommissioning.

**Art. 89. -** The licensee shall ensure that preventive measures for avoiding the occurrence of events that can affect radiological safety are implemented.

**Art. 90. - (1)** Following any abnormal event during decommissioning which significantly affected the radiological safety, the licensee shall carry out an investigation and implement corrective measures to prevent their recurrence and to recover an appropriate safety level as defined by the safety case documentation for decommissioning.

**(2)** The licensee shall ensure dissemination within the organization of the lessons learned following such an event.

## **Section 3**

### **Management of radioactive waste and of other material**

**Art. 91. -** The licensee shall safely manage the radioactive waste and other radioactive material, including fissile material under the safeguards control, as well as non-radioactive material or mixed hazardous material generated during decommissioning.

**Art. 92. -** During the elaboration and revision of the final decommissioning plan, the licensee shall determine the quantity and the type of existing radioactive material in the facility, through a detailed radiological characterization and based on the records collected during the operation phase.



**Art. 93. - (1)** Prior to starting decommissioning action, the licensee shall ensure the availability of adequate handling, sorting, characterization, treatment, conditioning and storage capabilities as well as the transport packaging for the radioactive waste, when necessary.

**(2)** The licensee shall elaborate, document and implement mechanisms for the actions provided under paragraph (1) and optimize the reduction of radioactive waste volume generated during decommissioning.

**Art. 94. -** The licensee shall ensure traceability for all radioactive and non-radioactive waste and shall keep all records of material that has been cleared according to the provisions of art. 18, as well as for non-radioactive waste generated during decommissioning.

#### **Section 4**

##### **Emergency preparedness and response**

**Art. 95. - (1)** The licensee shall develop the on-site emergency response plan for all decommissioning activities covered by the licence, in accordance with the specific regulations issued by CNCAN.

**(2)** The emergency response plan shall be periodically updated in order to reflect the changes in the facility state and the associated hazards during the decommissioning progress.

#### **Section 5**

##### **Physical Protection and Security**

**Art. 96. - (1)** The licensee shall establish and implement measures to ensure the physical protection and security at waste management facilities to prevent the unauthorized access of individuals and the unauthorized removal of radioactive materials.

**(2)** The requirement for physical protection and security are established in the specific regulation issued by CNCAN.

#### **Section 6**

##### **Nuclear safeguards**

**Art. 97. -** The licensee shall manage the radioactive waste under nuclear safeguards according to the specific regulation issued by CNCAN.

### **CHAPTER VIII**

#### **REQUIREMENTS ON COMPLETION OF DECOMMISSIONING ACTIVITY**

## Section 1

### Completion of decommissioning activity

**Art. 98. - (1)** After the completion of decommissioning activities the licensee shall update the final survey radiological plan to reflect the existing final survey to be performed.

**(2)** The content of the final radiological survey plan is provided in the Annex 7 which is integral part of this regulation.

**Art. 99. - (1)** The licensee shall perform the final radiological survey according to the plan provided in provided in art. 98 and to develop the final radiological survey report.

**(2)** The content of the final radiological survey report is provided in the Annex 8 which is part of this regulation.

**(3)** The final radiological survey report shall be submitted to CNCAN for review and approval.

**Art. 100. - (1)** The licensee shall have in place arrangements for development of an independent analysis of the final radiological survey report.

**(2)** Independent analysis of the final radiological survey report shall include the randomly verification of the results of measurements performed in support of final radiological survey.

**(3)** The independent analysis shall be performed by an organization recognized by CNCAN.

**Art. 101. - (1)** At the completion of all decommissioning activities, the licensee shall prepare the final decommissioning report.

**(2)** The final decommissioning report shall demonstrate, that the proposed end state of the facility or site has been achieved, in accordance with those provided in the decommissioning plan.

**(3)** The final decommissioning report shall be submitted to CNCAN for assessment and approval.

**(4)** The content of the final decommissioning report is provided in the Annex 9 which is an integral part of this regulation.

**Art. 102. -** The licensee shall ensure that relevant records as well as the final decommissioning report are available and accessible to the future owner of the site, at the end of decommissioning activity.

**Art. 103. - (1)** At the termination of decommissioning activities, the licensee shall apply to CNCAN for the release of facility from regulatory control.

**(2)** The content of technical documentation as support of application for the certificate for release of facility from regulatory control is provided in Annex 10 which is an integral part of this regulation.

## Section 2

### Release from regulatory control

**Art. 104. -** At the completion of decommissioning activity and obtaining of the certificate for release

from regulatory control, the licensee is released of responsibility for the facility, in the sense of art. 25 paragraph 3 of Law no. 111/1996.

**Art. 105. - (1)** In the case of release from regulatory control with restricted use, the licensee shall implement an appropriate surveillance and monitoring programme for the period of restriction.

**(2)** The limits and conditions for restriction are established by CNCAN and stipulated in the certificate for conditional release from regulatory control.

**Art. 106. -** In the case the release from regulatory control is for a part of the facility or site, the licensee shall request the modification of the decommissioning licence from CNCAN.

## CHAPTER IX FINAL PROVISION

**Art. 107. -** The decommissioning licences issued by CNCAN before the entry into force of this regulation shall remain valid until expiration of their validity.

**Art. 108. -** The approvals of the initial decommissioning plan and of any revisions of it, issued by CNCAN before the entry into force of this regulation shall remain valid until expiration of their validity.

### Annex 1

#### Terms, definitions, abbreviations

*Graded approach to safety* - The application of safety requirements in an appropriate manner with the characteristics of activities or radiation sources and with the magnitude and exposure risks.

*Licence* - legal document issued by CNCAN by which allow to a licensee to conduct nuclear activities according to Law no. 111/1996, republished, with subsequent amendments and completions; the definition is valid also for *certificate*, if granted by CNCAN.

*CNCAN* - National Commission for Nuclear Activities Control.

*Safety culture* - the assembly of characteristics and attitudes in organizations and the individuals who establish that, as an overriding priority, protection and safety issues receive the attention warranted by their significance.

*Decontamination* - the deliberate process for complete or partial removal of contaminants through physical, chemical or biological processes.

*Decommissioning* - administrative and technical actions taken to allow the removal of some or all of the regulatory controls from a facility.

*Safety case* - a collection of documents containing arguments, evidence and data in support of the safety of a facility or activity.

*Decommissioning actions* - procedures, processes and work activities as described in the approved final decommissioning plan.

*Conditional clearance* - the process by which the materials originated from practices in nuclear field or from intervention referring to chronic exposures, having the mass activity concentration or surface contamination below the clearance levels established/approved by CNCAN, are declared free for use with some restrictions, according to the conditions established for that clearance.

*Unconditional clearance* - the process by which the materials from practices in nuclear field or from intervention referring to chronic exposures, having the mass activity concentration or surface contamination below the unconditional clearance levels established/approved by CNCAN, are declared free for unrestricted use.

*Safety assessment* - assessment of all aspects of the site, design, operation and decommissioning of an authorized facility that are relevant to protection and safety.

*Event* - any occurrence unintended by the operator, including operating error, equipment failure or other mishap, and deliberate action on the part of others, the consequences or potential consequences of which are not negligible from the point of view of protection or safety.

*Completion of decommissioning actions* - process by which decommissioning actions as they are defined in final decommissioning plan are declared finished.

*Safety function* - a specific goal which shall be fulfilled in order to ensure the nuclear and radiological safety.

*Incident* - any unintended event, including operating errors, equipment failures, initiating events, accident precursors, or unauthorized act, malicious or non-malicious, the consequences or potential consequences of which are not negligible from the point of view of protection or safety.

*Facility, nuclear or radiological* - a facility and its associated land, buildings and equipment in which nuclear materials are produced, processed, used, handled, stored and disposed.

*Relevant radiological facility, medical, industrial, research* - radiological facility on such a scale that consideration of safety during decommissioning is required. Typical examples of such facilities: isotopes production facilities, electron accelerators above 10MeV, critical assemble, contaminated facilities, facilities using unsealed sources

*Ageing* - a general process in which characteristics of a structure, system or component gradually change with time or use.

*Management of ageing* - engineering, operations and maintenance actions to control within acceptable

limits the ageing degradation of structures, systems or components.

*Permanent shutdown* - permanent cease of the operation of a nuclear or radiological facility without intention to restart.

*Decommissioning plan* - an initial or final document with detailed information about the concept and schedule for the decommissioning and dismantling actions of a facility.

*Initial decommissioning plan* - a document developed and submitted to CNCAN as support to the licence application for construction phase.

*Final decommissioning plan* - a document developed and submitted to CNCAN for approval and also as support to the licence application for decommissioning phase.

*Updated decommissioning plan* - the general term used for any decommissioning plan issued subsequently to the initial decommissioning plan and prior to the final decommissioning plan.

*Representative person* - an individual receiving a dose that is representative of the more highly exposed individuals in the population, excluding those individuals having extreme or rare habits;

*Safety policy* - a documented commitment by the licensee to a high nuclear safety performance supported by clear safety objectives and targets and a commitment of necessary resources to achieve these targets. The safety policy is issued as separate safety management document or as visible part of an integrated organisation policy.

*Restricted use* - the use of a site or a building, subject to restrictions imposed for reasons of radiation protection and safety. Restrictions would typically be expressed in the form of prohibition of particular activities.

*Decommissioning strategies* – one of the following:

*Immediate dismantling* - the strategy in which the equipment, structures and parts of a nuclear facility containing radioactive contaminants are removed or decontaminated to a level that permits the facility to be released for unrestricted use, or with restrictions imposed by the CNCAN. In this case decommissioning implementation activities begin shortly after permanent cessation of operations. It implies prompt and complete decommissioning and involves the removal and processing of all radioactive material from the facility to another new or existing licensed nuclear facility for either long-term storage or disposal.

*Deferred dismantling* - the strategy in which parts of a nuclear facility containing radioactive contaminants are either processed or placed in such a condition that they can be safely stored and maintained until they can subsequently be decontaminated and/or dismantled to levels that permit the facility to be released for other uses. The period in which those parts are safely stored and maintained is the “period of deferment”.

*Entombment* - the strategy in which radioactive contaminants are encased in a structurally long-lived

material until radioactivity decays to a level permitting unrestricted release of the nuclear facility, or release with restrictions imposed by the CNCAN.

*End state criterion* - a predetermined criterion defining the point at which the specific task or process is to be considered completed.

*Structures, systems, components SSCs* - a general term encompassing all of the items of a facility or activity which contribute to protection and safety, except human factors.

The structures are the passive elements: buildings, vessels, shielding, etc. A system comprises several components, assembled in such a way as to perform a specific function. A component is a discrete element of a system.

*Licensee* - the legal person or any other legal entity having overall responsibility for any nuclear or radiological activity or for any authorized facility in accordance with the provisions of Law no. 111/1996, republished, with subsequent amendments and completions.

*Unrestricted use* - The use of a site or a building released from regulatory control without any radiologically based restrictions.

## **Annex 2**

### **The content of the programme for promoting and maintaining the safety culture**

1. Promoting individual and collective commitment for radiological safety at all levels of the organization.
2. Ensuring a common understanding of the key aspects of safety culture within the organization.
3. Providing the means by which the organization supports individuals and teams in carrying out their tasks safely and successfully.
4. Encouraging the participation of workers and their representatives and other relevant persons in the development and implementation of policies, rules and procedures dealing with radiological

safety.

5. Ensuring accountability of the organization and of individuals at all levels for radiological safety.
6. Encouraging open communication with regard to radiological safety.
7. Encouraging a questioning and continuous learning attitude and discouraging complacency with regard to radiological safety.
8. Providing means by which the organization continuously develops and strengthens its safety culture including appropriate training.

**Annex 3**

### **The content and format of the final decommissioning plan**

#### **1. Introduction**

- a. Regulatory framework, decommissioning requirements
- b. Safety requirements for decommissioning

#### **2. Description of facility**

- a. Location and description of site

- b. Description of buildings and systems
- c. Radiological status of facility
  - i. Description of contaminated structures, systems and equipments
  - ii. Contamination of soil, subsoil, surface water, underground water
- d. Operational history of facility
  - i. Authorisation history
  - ii. Description of the events which can affect the decommissioning
  - iii. Description of the prior decommissioning activities

**3. Decommissioning strategy**

- a. Decommissioning strategy
- b. Justification of selected decommissioning strategy

**4. Management of the decommissioning project**

- a. Legal requirements
- b. Description of the project management
- c. Organisation and responsibilities in project management
- d. Training and qualification of staff
- e. Contractors; management of contractors.

**5. Decommissioning actions**

- a. Decommissioning of contaminated structures
- b. Decommissioning of systems and equipments
- c. Management of contaminated soil
- d. Management of contaminated surface water and underground water
- e. Planning of decommissioning activities

**6. Inspection and maintenance**

- a. Equipment and systems which need inspection and maintenance during decommissioning
- b. Inspection and maintenance schedule

**7. Radioactive waste management**

- a. Identification of waste streams



- b. Estimation of types and quantities for radioactive waste including mixed waste
- c. Identification of disposal options

**8. Cost estimation and funding mechanism**

- a. Cost estimation
- b. Funding mechanism

**9. Safety assessment**

- a. Identification of safety criteria
- b. Operation limits and conditions for decommissioning
- c. Dose analysis for normal conditions
- d. Risk analysis for events and incidents
- e. Assessment of radiological consequences
- f. Measures for preventing and minimisation of consequences
- g. Assessment of non-radiological risk.

**10. Environment Impact Assessment**

- a. Environment monitoring programme
- b. Releases monitoring and control programme

**11. Radiological safety**

- a. Radiation protection programme
- b. Control of criticality
- c. Health and labour safety
- d. Data recording and archiving
- e. Assessment and optimisation of radiation protection programme
- f. Dose estimation and optimisation
- g. Release from regulatory control criteria
- h. Radiological survey

**12. Integrated Management System**

- a. Organisation and responsibilities
- b. Documents of management system
- c. Control of documents

- d. Control and testing of measuring instruments
  - e. Corrective actions
  - f. Records of management system
  - g. Audits and controls
- 13. Emergency planning, preparedness and response**
- a. Organisation and responsibilities
  - b. Emergency situation
  - c. Recording and reporting
- 14. Physical protection and safeguards**
- a. Organization and responsibilities
  - b. Physical protection programme
  - c. Safeguards programme
- 15. Final radiological survey plan**

### **The content of the safety case for decommissioning**

1. Description of the site, description of the facility layout, description of the decommissioning activities and phases.

2. Radiological characterization programme of the facility.
3. Demonstration how safety is achieved both for normal operation and accidental situations, addressing radiological hazards and conventional hazards, description of scenarios with radiological consequences and discharges.
4. Detailed descriptions of the safety functions for all SSCs with important functions for nuclear safety, their design basis and their functioning in all decommissioning states;
5. Anticipated decommissioning occurrences and accidents.
6. Regulations, codes and standards applicable for decommissioning.
7. Description of the relevant aspects of the decommissioning organization and the management system.
8. Documentation on the evaluation of the safety aspects related to the site.
9. Outline of the general safety objectives of decommissioning, design concept and the approach adopted to meet the fundamental safety objectives.
10. Description of the safety analyses performed to assess the safety of the facility in response to postulated initiating events against safety criteria and radiological release limits. Postulated initiating events are presented in the Annex 6 which is part of this regulation.
11. Safety assessment of the non-radiological risks including fire protection.
12. Description of the on-site emergency operational procedures and accident management guidelines, the inspection and testing provisions, the qualification and training of personnel, the decommissioning experience feedback programme, and the management of ageing.
13. Technical bases for and description of the operational limits and conditions.
14. Description of the policy, strategy, methods and provisions for radiation protection.
15. Description of the on-site radioactive waste management programme as well as any release from regulatory control.

## Annex 5

**The list of documents that shall be submitted to CNCAN as support of licence application for decommissioning**

1. Official Decision for permanent shutdown of the facility, published in the Romanian Official Journal;
2. Decision for nominating the responsible person for facility during decommissioning;
3. Decision for nomination the responsible person(s) for radiological safety;
4. Decision for nomination the qualified expert(s) in radiological safety;
5. Documents which prove the technical capabilities and licences required by law both for the facility and the persons involved in the decommissioning activity;
6. Documents which prove the availability of financial and material resources;
7. Final decommissioning plan approved by CNCAN;
8. Safety case developed according to Annex 4;
9. The list of contractors and their licences, which will be involved in decommissioning activities, their responsibilities and the interface between them and the licensee;
10. The list of dosimetric equipment;
11. The proof of paying the legal taxes for licensing the decommissioning activity;
12. Report describing the cleanup actions including the removal of operational radioactive waste and spent nuclear fuel during transition period.

## **1. External postulated events**

### **a. Natural phenomena**

- Extreme weather conditions -precipitation: rain, snow, ice, wind, lightning, high or low temperature, humidity
- Flooding
- Earthquake
- Natural fires
- Effect of terrestrial and aquatic flora and fauna
- Possible combinations of such conditions.

### **b. Human induced phenomena**

- Fire, explosion or release of corrosive/hazardous substance
- Aircraft crash (accidents)
- Mechanical impact due to structural/mechanical failure in surrounding installations
- Flooding
- Power supply and potential loss of power
- Civil conflict
- Possible combinations of such conditions

## **2. Internal postulated events**

- Loss of energy and media supply: Electrical power supplies, air and pressurised air, vacuum, super heated water and steam, coolant, chemical agents, and ventilation;
- Improper use of electricity and chemicals
- Mechanical failure
- Instrumentation and control, human failures
- Internal fires and explosions
- Flooding, vessel overflows.

## **1. Facility description**

- a. Type and location of facility
- b. Current state of the site
- c. Current state of the facility

## **2. Background**

- a. Reasons for decommissioning
- b. Decommissioning management approach

## **3. Operating history**

- a. Licences obtained before decommissioning
- b. Actions performed before decommissioning
- c. Incidents during operation and decommissioning phase

## **4. Decommissioning actions**

- a. Decommissioning objective
- b. Results of the previous radiological surveys
- c. Decontamination and dismantling procedures

## **5. Final radiological survey procedures**

- a. Sampling
- b. Equipment/instruments/ techniques and instructions selected
- c. Procedures/methods selected.

## **The content and format of the final radiological survey report**

1. Decommissioning actions - results of previous radiological surveys
2. Final radiological survey procedures used
3. Final Radiological Survey findings
  - a. Summary of findings
  - b. Techniques used for data evaluation
  - c. Statistical evaluation
  - d. Comparison of findings with regulatory limits and conditions
  - e. Assessment of acceptability
4. Conclusions of the final radiological survey report
5. Annexes - detailed survey data, maps of measurements points, etc.

### **The content and format of final decommissioning report**

1. Description of the facility before decommissioning; description of end state of the facility under decommissioning.
2. Objectives of the decommissioning, summary of licensing steps.
3. Radiological criteria used as a basis for the removal from regulatory control of the equipment, buildings, site.
4. Description of the performed decommissioning actions.
5. Description of any remaining buildings, structures or equipment, at the time of released from regulatory control and/or at time of conversion to other use.
6. Structures, areas or equipment designated for restricted use.
7. Final radiological survey report.
8. Inventory of radioactive materials, including amounts and types of waste generated during decommissioning and their location for storage and/or disposal.
9. Inventory of materials, equipment and premises released from regulatory control.
10. Summary of any abnormal events and incidents that occurred during decommissioning.
11. Summary of occupational and public doses received during the decommissioning.
12. Description of gained experience, lessons learned and final conclusions.



**List of documents that shall be submitted to CNCAN in support of the application for release from regulatory control**

1. Application for Certificate;
2. Final Decommissioning Report;
3. Summary of the Radiological Surveillance Report;
4. Sanitary Certificate;
5. Environmental Certificate / Acceptance
6. Independent analysis of the final radiological survey report including the random verification of the results of measurements performed in support of final radiological survey;
7. The environmental reconstruction programme of the site, as necessary.