WG 1: Safety and regulatory aspects of Decommissioning Plan

Rahman, (Egypt), Yang (China), Lam Pham (Vietnam), Ameur (Algeria), Parami (Philippines), Rapporteur/reporter, Berthie (Indonesia), Vujovic (Serbia), and Ruperti (Brazil)

WG-1BRAINSTORMING

TASK OF WG-1

- Review of Decommissioning Plan (DP) of VVR-S Research Nuclear Reactor, Revision No. 9, May 2008
- Focus:

  Regulatory and Safety Aspects

References

- IAEA Safety Report Series 45, Standard Format and Content for Safety Related Decommissioning Documents
- International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources, IAEA Safety Series No.115, 1996
- Decommissioning of Nuclear Facilities Using Radioactive Material, IAEA Safety Standards Series No. WS-R-5, 2006

Review Strategy

- Verification of contents and format of license application for decommissioning of RR
  - Completeness of chapters
  - Completeness and reasonableness of contents chapters more critical to safety and regulation
- Limitations
  - Time
  - Available documents
  - Learning exercise

Chapters considered critical to safety

- Chapter 1 – Introduction
- Chapter 2 – Facility description
- Chapter 3 – Decommissioning strategy
- Chapter 4 – Project management
- Chapter 5 – Decommissioning activities
- Chapter 6 – Maintenance and surveilance
- Chapter 7 – Radioactive Waste Management
- Chapter 9 – Radiological Safety Assessment
- Chapter 10 – Environmental Assessment
- Chapter 11 – Health and Safety
- Chapter 12 – Quality Assurance
- Chapter 13 – Emergency Planning
- Chapter 15 – Final Radiation Survey

INTRODUCTION

- Revision No.9 was submitted on 17 March 2008 which was still within the issued license validity period, 18 March 2007-17 March 2009
- VVR-S (Water moderated –water cooled reactor) Nuclear Research Reactor
- Operation history
  - 40 years, produced 9.51 GWd
  - 65% utilization factor
  - Effective operation 9510 days
  - 1 MW average thermal power

General comments

- All chapters of IAEA SRS 45 are considered in DP
- Units are not consistent (e.g. units in the text are in uSv and in the Tables uR); among chapters and supporting documents.
- Some inconsistencies in referencing e.g., Figure numbers

SPECIFIC COMMENTS

- Chapter 1 (Introduction) – Complete
- Chapter 2 (Facility Description)
  - Chapter 2.3 (Radilological status) considered as critical because this is the basis for all decommissioning works
  - Computer codes used in the calculations for estimating the contamination and neutron activation for 40 years operation have been validated
  - Verification of calculation must be done by actual measurements e.g. primary circuits and hot cells
  - Integrity of building must be assured during dismantling and removal of the hot cells, pumps and other parts of primary circuit at the basement of the building
  - Sequence of decontamination of areas and rooms must be clearly described, e.g. to identify rooms to decom first and rooms to decom last; measures to prevent recontamination must be described; and ALARA measures must be included.

SPECIFIC COMMENTS (2)

- Chapter 3 (Decommissioning Strategy)
  - The rationale for deciding on 3 phases must be included and the interrelationships of these phases must be described.
  - Subchapter 3.4. (Key issues in implementation of decommissioning strategy) - The basis of the contents and the duration of each phase must be described or referenced if included in the supporting documents

SPECIFIC COMMENTS (3)

- Chapter 4 (Project Management)
  - The work activities under Phases 1, 2, 3 must be consistently described in Chapters 3.4, Chapter 5.4 (Table
  - Subchapter 4.2.4 (Management of decommissioning project) – Work activities have to be grouped according to phase 1,2 and 3
  - Figure 4.3.3 Organization chart
    - Radiation protection and safety group is not directly under the project manager
  - Subchapter 4.6.2 (Training program)
    - Under Planned Training Programmes, provide list of training with mock-up
  - Subchapter 4.7 (Assistance of the Contractors)
    - The determination of the qualification of contractors must be the primary responsibility of the licensee and should not only rely on the license issued by regulatory body to the operator

SPECIFIC COMMENTS (4)

- Chapter 5 (Decommissioning Activities)
  - Subchapter 5.4 (Planning of decommissionig activity)
    - The critical path must be described and submitted prior to the start of decomissioning activities.
  - Radioactive wastes must be segregated in containers according to 9 classification of wastes as enumerated in Chapter 7

SPECIFIC COMMENTS (5)

- Chapter 6 (Surveilance and maintenance)
  - Subchapter 6.4.3 (Dosimetry section)
    - The procedures on Dosimetry System must be provided

SPECIFIC COMMENTS (6)

- Chapter 7 (Radioactive Waste Management)
  - The criteria of waste clasification must be included (4 types of wastes – exempt, very low level waste, short lived waste, long lived waste)
  - Table 7.2.1 must be presented according to the 4 classification of wastes or according to the 9 classes of wastes and it must reflect the criteria of waste clasification
  - Clear description of all types of containers for liquid and solid wastes must be included. (Make reference to supporting documents, if available)
    - Marking and labeling of packages/containers according to classification of activity of wastes
  - The destination of the very low level wastes must be clarified
  - Supporting document on safety and security procedures during transport of radioactive wastes to final repository to satisfy CNCAN order No 357/2005 must be submitted.
  - Estimate of total waste volume according to types of radiation (alpha, beta, and gamma) must be submitted

SPECIFIC COMMENTS (7)

- Chapter 9 (Radiological Safety Assessment)
  - Term “in normal doses” in Annex 9.5.3 must be clarified.
  - Safety assessment in case of sabotage or terrorism (bomb explosion at the highly activated/contaminated pipes) must be included in subsection 9.4.2 (Events and incident due to external causes).

SPECIFIC COMMENTS (8)

- Chapter 10 (Environmental Assessment)
  - The monitoring location points in Fig 10.3-1 do not correspond to Table 10.3-1 (Types of the Samples and Frequency of Sampling and Analysis), e.g. water from river discharge, 4 points in the Figure while only 2 samples in the Table; and this must also correspond to the actual sampling and analysis.
  - The derived limits of radionuclides must be presented.
  - National requirement on environmental and population protection – Appendix 9.1.2 is missing
  - Environmental Impact Study and Environmental balance-Level II on assessment of decommissioning activity impact on the environment must be included

SPECIFIC COMMENTS (9)

- Chapter 11 (Health and Safety)
  - If contractors/subcontractors are covered by the Radiation Protection Plan described in Subsection 11.1 (Radiation Protection Plan) must be clarified.
  - Instrumentation mentioned in subsection 11.1.6 (Contamination control program), the supporting documents on the list of instruments must be referenced.

SPECIFIC COMMENTS (10)

- Chapter 12 (Quality assurance)
  - The percent sign (%) in Table 12.3.1 (QMP performance indexes) must be consistently used to avoid confusion
  - Summary of Quality Manual, System Procedures and Operational procedures must be provided in the form of table and must be included in supporting documents

SPECIFIC COMMENTS (11)

- Chapter 13 (Emergency Planning)
  - The Emergency Plan must be reviewed periodically (in annual bases)
  - Subchapter 13.1 (Organization and responsibilities)
    - Reporting of abnormal events must be reprted to higher level than the head of the Committee for Intervention in Emergency Situation (CISU), who is also Director General of IFIN-HH, depending on the emergency situation (case by case basis).

SPECIFIC COMMENTS (12)

- Chapter 15 (Final Radiation Survey)
  - Subsection 15.2 (Design of final radiation survey)
    - Audit must be included to the list of quality assurance requirements for the final radiation survey

CONCLUSION

- On regulatory and safety aspects, the submitted DP is substantial in its content and format
- The license can be issued with conditions, e.g. conduct of training
- Maintain open communication and transparency between IFIN-HH and CNCAN

- The facility visit was very useful in the DP review
- The DP review exercise is a very worthwhile learning experience
- WG-1 would like to congratulate IFIN-HH and CNCAN

Thank you for your attention !!!