Safety Related Documentation and Regulatory Review for PRR-1 Decommissioning Project

Eulinia M. Valdezco
Nuclear Regulations, Licensing and Safeguards Division (NRLSD)
Philippine Nuclear Research Institute
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• Summary
The PNRI is the center of nuclear science and technology activities in the Philippines.

*It is one of the research institutes under the Department of Science and Technology.*
1. Conduct research and development on the application of radiation and nuclear materials, processes and techniques in agriculture, food, health, nutrition and medicine and in industrial or commercial enterprises;

2. Undertake the transfer of research results to end-users including technical extension and training services;

3. Operate and maintain nuclear research reactors and other radiation facilities; and

4. License and regulate activities relative to production, transfer and utilization of nuclear and radioactive substances.
PNRI Organization

DIRECTOR

DEPUTY DIRECTOR
- Planning
- Technical Assistance
- Internal Audit

ATOMIC RESEARCH DIVISION
- Agricultural Research
- Biomedical Research
- Health Physics Research
- Applied Physics Research
- Chemistry Research
- Analytical Measurements Research
- Isotope Techniques Research
- Nuclear Materials Research

NUCLEAR SERVICES AND TRAINING DIVISION
- Nuclear Reactor Operations
- Engineering Services
- Irradiation Services
- Nuclear Training Center
- Computer Services
- Radiation Protection Services
- Information Services
- Library Services

NUCLEAR REGULATIONS, LICENSING AND SAFEGUARDS DIVISION
- Standards Development
- Inspection and Enforcement
- Licensing, Review and Evaluation
- Safeguards
- Radiological Impact Assessment

FINANCE AND ADMINISTRATIVE DIVISION
- Budget Unit
- Accounting Unit
- Cash Unit
- Property and Procurement Unit
- Personnel Unit
- Records and Communications Unit
- Plant Services Unit
- Motorpool Unit
Nuclear Regulations

- Standard Setting and Rule Making
- Notification, Registration and Licensing
- Compliance Monitoring and Enforcement
- Safeguards and Security
Nuclear Regulations

- Radiological Emergency Planning and Preparedness
- Internal Regulatory Control Program for PNRI Facilities
- Research and Development
Legislative Framework
• R.A. No 2067 (The Science Act of 1958)
  - created the Philippine Atomic Energy Commission (PAEC) under the jurisdiction of the National Science Development Board (Section 16)
  - the PAEC was responsible for research and development work on nuclear energy
Legal Framework

• R.A. № 5207 (The Atomic Energy Regulatory and Liability Act of 1968)
  - declared as a policy the use of atomic energy for peaceful purposes
  - strengthened PAEC and gave it powers to regulate atomic energy facilities
Legal Basis for R\textsuperscript{2}D\textsuperscript{2}P

- Three (3) Laws exist but not covering decommissioning, among others
  - RA 5207 (Atomic Energy Regulatory and Liability Act of 1968)
  - RA 2067 (The Science Act of 1958)
  - Presidential Decree 1586 (Philippine EIS System Law)
Legal Basis for $R^2D^2P$

- Draft Law “Comprehensive Nuclear Regulation Act of 2007” undergoing the legislative mill process, will cover decommissioning, among others.
Dual Role of PNRI

- The PNRI has the roles of promoting nuclear technology, providing services, and regulating the use of nuclear and radioactive materials.
- PNRI’s own nuclear and radiation activities are exempt from licensing.

“This is addressed in the proposed 2007 Comprehensive Nuclear Law.”
Rules & Regulations
Internal Regulatory Control Program of PNRI Facilities

- Established in 2004 to set up a system of authorization for PNRI nuclear and radiation facilities and laboratories – PNRI Office Order
- Rules for the Authorization of the PRR-1 (Extended Shutdown and Decommissioning)- PNRI Office Order No. 003, Series of 2008
Scope & Coverage

- Philippine Research Reactor (PRR-1)
- Co-60 Multi-Purpose Irradiation Facility
- Radioisotope Dispensing Laboratory
- Radioactive Waste Management and Interim Storage Facility
- Secondary Standard Dosimetry Laboratory
- Some PNRI research laboratories where radioactive materials are used and handled
Nuclear Regulations, Licensing, & Safeguards Division (NRLSD)

• Tasked to implement the Program
• Consists of the following Sections:
  - Standards Development Section
  - Licensing, Review, and Evaluation Section
  - Inspection and Enforcement Section
  - Safeguards Section
  - Radiological Impact Assessment Section
The protection of individuals, society and the environment against radiological hazards related to decommissioning is subject to the following:

- PNRI Policy Instruction № 02 Series of 2001 entitled Radiological Health and Safety Policy
- IRCP of PNRI Facilities was established thru PNRI Office Order № 002 Series of 2004
Authorization of PRR-1

• Granted Authorization to maintain its shutdown condition on May 21, 2007
• Granted “Permission with Conditions” to perform some activities in preparation for doing a characterization survey on February 12, 2008
• Additional documents to support request for authorization to transfer some radiation sources to the Radioactive Waste Management Facility submitted on September 9, 2008. Request is under review and evaluation
Regulatory Requirements for PRR-1 Decommissioning
Application for Decommissioning Authorization of the PRR-1

• It is the responsibility of the PRR-1 operators to comply with all the requirements set out in the PNRI Internal Regulatory Control Program and related rules and regulations prior to the issuance of an authorization.

• The application shall be accompanied by a Decommissioning Plan.
Decommissioning Plan:
Major Requirement of the Application for Decommissioning Authorization

- The PNRI Internal Regulatory Control Program requires facility operators to submit a decommissioning plan before an authorization can be issued.
- The plan shall address all provisions to protect the health and safety of both workers occupationally exposed to radiation and members of the general public considering normal and accident conditions.
Decommissioning Plan: Major Requirement of the Application for Decommissioning Authorization

- The plan shall provide all steps that lead to eventual complete decommissioning to the point that safety can be ensured with minimum or no surveillance.
- A graded approach can be applied to the development of the plan.
Decommissioning Plan (1)

- A description of the experience, resources, responsibilities and structure of the decommissioning organization, including the technical qualification/skills of the staff;
• An assessment of the availability of special services, engineering and decommissioning techniques required, including any decontamination, dismantling and cutting technology as well as remotely operated equipment needed to complete decommissioning safely;
Deacommissioning Plan (3)

• An assessment of the amount, type and location of residual radioactive and hazardous non-radioactive materials in the reactor installation, including calculational methods and measurements to be used to determine the inventory of each;
• A description of the waste management approach and strategy
• Safety and environmental impact assessment
Decommissioning Plan (4)

- Operational Radiation Protection
- Human and Financial Resources
Waste Management (1)

- Identification and characterization of waste inventory by type, RN content, volume, etc.
- Classification of radioactive waste generated
- Proposed strategy for waste processing, transport, storage, or disposal
Waste Management (2)

- Application of clearance levels for reuse or recycling
- Effluent control and discharges
- Other considerations, as appropriate
Quality Assurance (QA)

• Quality Assurance is part of the authorization process for PRR-1 and is subject to periodic inspection by the regulatory body

• The QA program shall consider the management of spent and fresh fuel
Operational Radiation Protection (1)

- The Internal Regulatory Control Program (IRCP) clearly defines
  - exposure limits involving sources of ionizing radiation for both workers occupationally exposed to radiation and members of the general public (BSS based)
  - regulations also prescribe the appropriate corrective measures to be implemented to control the release of radioactive materials into the environment and to mitigate its effects
Operational Radiation Protection (2)

- The PRR-1 operators are required to submit radiation protection and safety program which includes functions, responsibilities, and qualification and training of individuals.
- The PRR-1 operators are required to submit a safety analysis report to demonstrate that the facility will meet all operational radiation protection provisions in fulfillment of the requirements of the IRCP for PNRI Facilities.
Human and Financial Resources

- The personnel responsible in the decommissioning activities must demonstrate that they are qualified by reason of training and experience to carry out the activities for which the license or authorization is sought in a manner that protects health and minimize danger to life or property.
Human and Financial Resources

- The PRR-1 operators shall show that it either possesses the necessary funds and/or has reasonable assurance of obtaining the necessary funds, to cover the estimated costs of conducting all authorized activities including costs of construction and disposal.
Emergency Preparedness

- The PRR-1 operators are required to prepare and submit a facility emergency response plan for approval of the NRLSD.
- The level of preparedness is commensurate to the level of hazards expected in the facility.
**Inspection and Enforcement**

- Compliance with the requirements of authorization regarding nuclear safety and security and radiation protection is verified and enforced by the Inspection and Enforcement Section of the NRLSD.
- An Inspection Manual for decommissioning of Research Reactors based largely on the USNRC manual is in the final stages of preparation.
Inspection and Enforcement

• This is done by reviewing submissions of the facility operators which includes safety analysis report during the authorization process and also by conducting announced and unannounced inspections during decommissioning
The CPR PART 3 Standards for Radiation Protection is largely consistent with the IAEA SS 115 International Basic Safety Standards.

- Establish the standards for protection against radiation arising from the use of nuclear and radioactive materials and related activities.
Regulatory and Safety Standards (2)

- Provision for the general requirements involving waste management and disposal of licensed radioactive material
  - Storage under controlled conditions
  - Control of environmental discharges
  - Monitoring of discharges
  - Regulatory limit for airborne and waterborne discharges
  - Clearance levels for solid waste materials
Regulatory and Safety Standards (3)

• CPR PART 4 Regulations for the Safe Transport of Radioactive Materials in the Philippines based on IAEA ST-R-1, Regulations for the Safe Transport of Radioactive Materials
• CPR PART 26 Security of Radioactive Sources
• Other internationally acceptable standards (IAEA, WHO, NEA, USNRC, etc)
Regulatory Review Process

FLOWCHART OF REGULATORY CONTROL PROGRAM ACTIVITIES

NRLSD

Prepares regulatory requirements for submission

NRLSD Chief receives documents and endorses for evaluation

LRE checks completeness of documents and evaluation/verifies information submitted

ARIA, STND, SOG evaluates & prepares evaluation reports

Final submission complete and acceptable?

Approved

Disapproved

NRLSD Chief reviews/approves issuance/authorization

IE conducts inspections and prepares IR

NRLSD Chief reviews/approves IR

IE verifies compliance

Items of non-compliance concern open?

Y

N

Updates list of open

RSSB

Reviews and endorses application to NRLSD

OPERATOR

Completes application form and requirements for submission and submits to RSSB

*Application may be for:
1. Authorization
2. Modification of Conditions
3. Termination

Prepares and submit additional information/requirements

Receive approved authorization

Receive IR for compliance information

Implements corrective actions, if any

Submit reply to IR
Application for Decommissioning Authorization of the PRR-1

- Single authorization or multi-authorization according to each defined decommissioning phase of the project
- Authorization to be granted will be based on the approved decommissioning plan
NON-RADIOLOGICAL HAZARDS
Survey of Regulatory Requirements: Non-Radiological Hazards

- Department of Environment and Natural Resources (DENR) is the lead implementing government agency
- Exempted from the Philippine EIS System Law are projects operating prior to 1982.
- Department of Labor & Employment (DOLE), Occupational Health & Safety Agency (OSHA) is responsible for workers safety
- Demolition of physical infrastructures in general, shall comply with the demolition procedure in accordance with the National Building Code of the Philippines (PD 1096)
Requirements to Secure Demolition Permit

- Structural Plan
- Structural Design and Analysis
- Bill of Materials
- Barangay Clearance
- Existing Building Permit for Renovation/Repair/Additional

**Need to be addressed as the reactor did not have any building permit during its design and construction phase**
DEMOlITION PERMIT APPLICATION

I have the honor to apply for a permit to demolish ____________________________

building/structure located at ____________________________

shown in the sketch at the back of this form

In this connection, I hereby certify to the following, to wit:

1) The undersigned is the bonafide owner/authorized representative of the building/structure to be demolished.

2) The building/structure is not leased to any part and is not involved in any court litigation.

3) The subject building/structure is already vacated and all utility lines such as water, electric, gas and telephone have been disconnected.

4) The Real Estate Tax of such building/structure has been paid for the current year as per herein attached copy of the receipt.
Summary

• The PNRI Internal Regulatory Control Program established a system of authorization that is now in place and continuously reviewed for a more effective implementation.

• The Regulatory Review Process for the PRR-1 Decommissioning has adopted a multi-phase authorization process in accordance with the defined phases of the PRR-1 Decommissioning Plan.

• The Comprehensive Nuclear Law of 2007, now undergoing the legislative mill process, addresses the many gaps identified in the legislative framework and the need for an effectively independent regulatory body.
THANK YOU

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SALAMAT PO

emvaldezco@pnri.dost.gov.ph
www.pnri.dost.gov.ph