

20th

FNCA
Forum for Nuclear Cooperation in Asia



Ministerial Level Meeting

PHILIPPINES
COUNTRY  REPORT



ISO 9001

Human Resource Development Plan (HRDP) Nuclear Power Plant



Official Phase 1 Mission Report of the Integrated Nuclear Infrastructure Review (INIR) Mission

- ❑ INIR Missions are conducted by the International Atomic Energy Agency (IAEA) to assist its Member-States in evaluating the status of the 19 infrastructure issues to determine the possibility of introducing a safe, secure, and sustainable national nuclear program.
- ❑ The DOE-Nuclear Energy Program Implementing Organization (NEPIO) was created in October 2016, in compliance with IAEA policy guidelines, to spearhead unified and coordinated efforts and activities relative to the conduct of various studies and research on the feasibility of nuclear energy development in the Philippines.



INIR Mission Recommendations

Areas where action could assist in making further progress.

- ☐ Involve a broader range of stakeholders in completing the work required to enable a national commitment
- ☐ Develop a legal and regulatory framework to ensure and demonstrate commitment to safety, security and non-proliferation
- ☐ Enhance its approaches to human resource and leadership development program, nuclear fuel cycle options and electrical grid impacts.
- ☐ Adapt the existing national frameworks for emergency preparedness and response and nuclear security.



Human resource development

Necessary knowledge and skills identified, and gaps in current capability assessed

- ❑ NEPIO will prepare a Human Resource Development Plan for the nuclear power program.
- ❑ The Philippines generates a sufficient pipeline of engineering, science, and non-technical graduates.
 - To introduce nuclear topics as electives in the existing curricula of the engineering and natural sciences programs
 - To establish Master's and doctoral programs in nuclear engineering and related courses;
 - To develop programs in the vocational/technical schools to produce skilled technicians in relevant disciplines
 - To reintroduce nuclear-related courses, topics, and materials into the curricula at primary and secondary levels and to conduct outreach activities to engage students.



Human resource development

Development of human resources planned

- ❑ HRD Roadmap for NPP intends to integrate plans for short-, mid-, and long-term activities and serve as a guide for various groups and stakeholders.
- ❑ NEPIO intends to promote a systematic approach to training (SAT) in the nuclear power programme to ensure that the industry-required knowledge, skills and attitudes are developed by the training programme.
- ❑ HRD Plan will be developed related to the needs of the NEPIO. Implemented activities include:
 - Training by PNRI at its Nuclear Training Center
 - Meetings with universities to develop nuclear engineering courses at BS, MS, and PhD levels
 - Training on legislative framework;
 - MOA between PNRI and different government departments on education and training, and
 - An IAEA TC project design for 2020-2021 on establishing a graduate programme in nuclear science, engineering and management
- ❑ The Philippines is considering the option to engage foreign experts through a variety of mechanisms, e.g., hiring foreign consultants, engaging consulting firms, hosting international conferences, sending students to foreign academic institutions, etc.



Human resource development

Draft Staffing Requirements for NPP Organizations per Milestone and by Education Degree Level

Project Phase	Total Man power	PhD	MS	Bachelor's Degree	Vocational Technical
Pre-Project (Phase 1)					
NEPIO	50 – 75	0	0	50 – 75	0
Regulator	40-60	0	3-4	34-52	3-4
Owner/Operator	0	0	0	0	0
Technical Support	40-60	0-1	9-14	12-18	19-27
Project Decision Making (Phase 2)					
NEPIO	75-100	3	0	75-100	0
Regulator	60-100	0	17-43	20-50	3-7
Owner/Operator	0-30	0	7	9	14
Technical Support	10-35	0	2-8	3-11	5-16
Construction (Phase 3)					
NEPIO	10-50	3	0	10-50	0
Regulator	100-150	0	43-64	50-75	7-10
Owner/Operator	30-1000	0-10	7-230	9-300	14-460
Technical Support	3-10	0-1	1-2	1-3	1-5



Research Reactor Utilization



Project:

Subcritical Reactor Assembly for Training, Education and Research (SATER) by using the PRR-1 TRIGA fuel elements expected to be commissioned by 2020

Current Status

Without an operating nuclear facility, knowledge and expertise in nuclear and reactor engineering has gradually declined in the Philippines.



115 slightly irradiated TRIGA fuel rods in wet storage
15 fresh fuel in dry storage

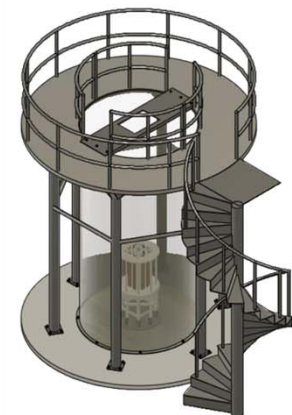
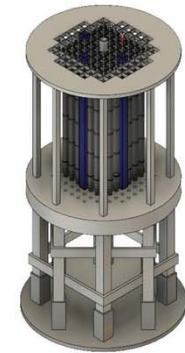




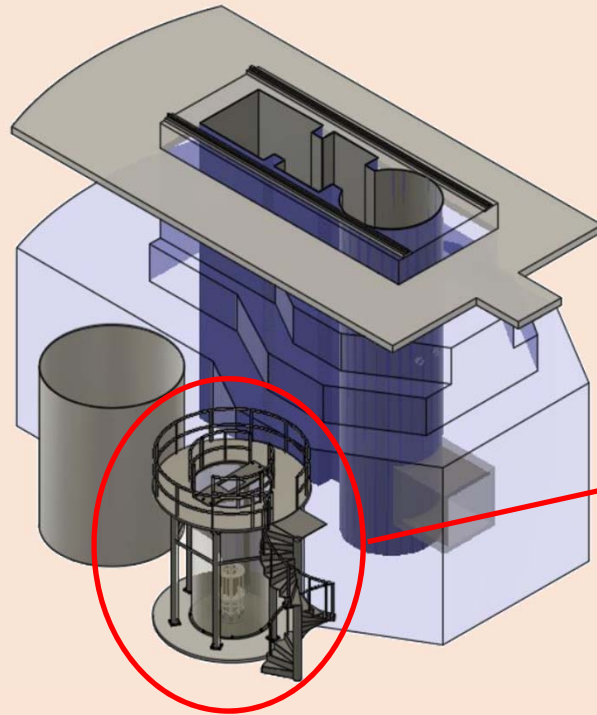
PRR-1 Objectives

Utilization

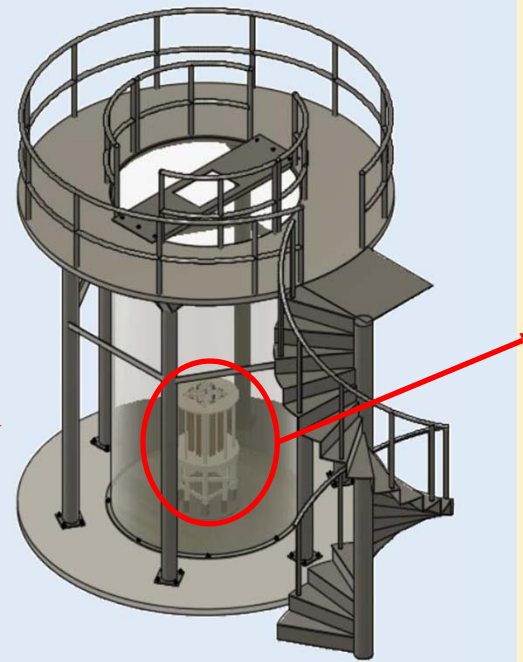
Phase 1: Subcritical Assembly				Activities
2017	2019	2021	2023	
<ul style="list-style-type: none"> • Build capacity in reactor and nuclear science, technology • Enhance various stakeholder engagement • Demonstrate capability to safely utilize the facility • Investigate the feasibility of the facility to proceed to the next phase 				<ul style="list-style-type: none"> → Capacity building activities (On-going and planned graduate studies, trainings) → Building stakeholder base through collaborations and partnerships → Compliance to safety standards and regulations via graded approach → Comprehensive study on additional instrumentation (e.g. cooling, power monitoring, etc) and safety analysis
<ul style="list-style-type: none"> • Training and education • Reactor physics experiments • Basic irradiation services • Basic neutron activation analysis 				<ul style="list-style-type: none"> → Reactor Engineering Courses, Internet Reactor Laboratory, Graduate Program in nuclear engineering → Reactor model validation, measurement of reactor physics and kinetic parameters → Neutron irradiation of samples → Neutron activation analysis of large samples



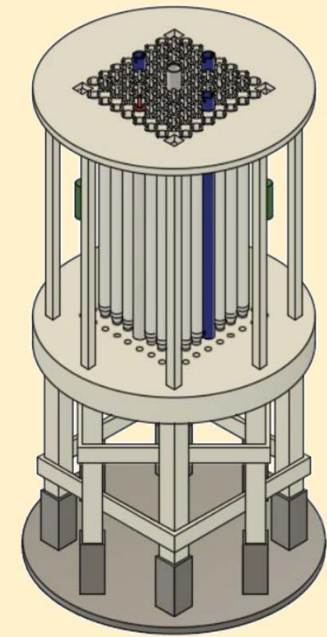
PRR-1 SATER Design



Relative location of the SATER assembly to the existing structures in PRR-1



SATER Assembly, all structures will be new. Fabrication will include appropriate qualification process.



Core support structure



FNCA Philippines Accomplishments in Radiation Oncology

- Participation on published and ongoing multicenter and regional clinical trials of FNCA (Cervix I-V, NPC I-III and Breast-I clinical trials) since 1993, through Dr. Miriam Joy Calaguas (PL) and Dr. Rey de los Reyes.
- Participation in annual FNCA workshops and meetings since 1993 where PH delegates presented our Philippine clinical trial data and became moderators, session chairs and lecturers (open forum).
- Promotion of multidisciplinary team approach in the management of malignancies specifically on increasing awareness on the roles and indications of radiotherapy/radiation oncology.
- Increase in Image Guided Brachytherapy (IGBT) procedures specifically in cervical cancer in the Philippines.



FNCA FY2019 Workshop on Radiation Oncology Project

October 28-31, 2019, Suzhou and Shanghai, China

Philippine Delegates Accomplishments



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CERTIFICATION
INTERNATIONAL

Presentation of Philippine Data and Session Chairs



Phase II Study of Neoadjuvant
Chemotherapy with Concurrent
Chemoradiotherapy (CCRT) for
Nasopharyngeal Carcinoma
(NPC-III) – presented by Dr.
Jerickson Flores

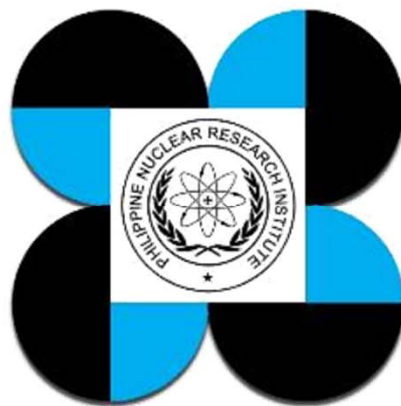


Prospective Observational
Study of 3D-Image guided
brachy therapy for Locally
Advanced Cervical Cancer
(CERVIX-V) - Philippine data
presented by Dr. Jaemelyn
Fernandez



Phase II Study of
Hypofractionated Radiotherapy
for Breast Cancer
(Postmastectomy Radiation
Therapy (PMRT)/BREAST-I) –
presented by Dr. Jaemelyn
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THANK YOU

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