

**STUDY FOR ACTION PLAN PROPOSAL ON SOME ISSUES  
OF THE NATIONAL NUCLEAR INFRASTRUCTURE  
FOR THE NEW RESEARCH REACTOR PROJECT  
IN PHASE 1&2**

**Cao Hong Lan\*, Nguyen Nhi Dien\*\*, Bui Dang Hanh\*, Vu Quang Linh\*  
Tran Thi Kim Oanh\*, Tran Ngoc Hoan\*, Nguyen Bach Viet\*, Nguyen Thuan Yen\*  
Vu Thi Lieu\* and Pham Thanh Huong\*.**

*\*Vietnam Atomic Energy Institute*

*\*\* Nuclear Research Institute*

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- **Contact email:** [caohonglan66@yahoo.com](mailto:caohonglan66@yahoo.com)
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**Abstract:** The Project on construction for a new research reactor in Vietnam is under preparation. At the same time, it is necessary to prepare a firm and comprehensive national nuclear infrastructure which is aimed to implement smoothly and ensure safety and security for the project. How is the status of the nuclear infrastructure for research reactor project in Vietnam, how can it be assessed, what is the assessment used for and what are we going to do with that? So, all of these things are the goals set out to address in this Task. However, due to time constraints and conformity with requirement of project progress, this Task assessed only 8 critical issues in infrastructure in phase 1&2, including National position; Management; Legislative framework; Regulatory framework; Human resource development; Radioactive waste; Site survey, site selection and evaluation; and Environmental protection. Conditions and criteria in the documents on milestones and assessment of the national nuclear infrastructure to support a new research reactor project of the International Atomic Energy Agency (IAEA) were used as bases for assessing the Vietnam's infrastructure status. The results of the Task are assessment and identification for gaps which need to be addressed and proposing for a plan on completing the national nuclear infrastructure for the research reactor project on 8 issues in stages 1&2.

**PREAMBLE**

The new research reactor project should be supported by a national nuclear infrastructure. Most of the infrastructure issues for a research reactor project are similar to that of nuclear power plants but in a lesser degree. However, the completed national infrastructure needs to have a certain position to ensure that the risks to nuclear safety as well as nuclear security are adequately dealt with any incident occurred in operation of the research reactor.

In 2012, the International Atomic Energy Agency (IAEA) has developed and published the "Specific Considerations and Milestones for a Research Reactor Project". This document identifies 19 issues needed to complete the nuclear infrastructure to ensure the safety and security for the research reactor project from the start of the project to the commissioning, maintenance and dismantling of the research reactor. These issues cover the whole of the main things from the National position, Nuclear safety, Management, Funding and financing, Legislative framework

Regulatory framework, Safeguards, Radiation protection, Research reactor utilization, Human resource development, Stakeholder involvement, Site survey, site selection and evaluation, Environmental protection, Emergency planning, Nuclear security, Nuclear fuel management, Radioactive waste, Industrial involvement, Procurement.

By May 2015, the IAEA has drafted the eighth version of Assessment of the National Nuclear Infrastructure to Support the New Research Reactor Project to guide member countries in the survey, analyze and assess the nuclear infrastructure of each country.

At present, Vietnam Atomic Energy Institute is directly preparing to implement the project on construction for the Center of Nuclear Science and Technology in which the key component is a new research reactor. This is the first research reactor that Vietnam has undertaken from the early stages of preparation of investment projects to site selection, construction and operation, etc., so that for safe and smooth implementation of project, the assessment of infrastructure for research reactor project follows IAEA recommends for 19 issues in three milestones, three phases and conditions to be met at each milestone is essential to identify the gaps that Vietnam needs to overcome, improve its infrastructure.

In the short term, in line with the project implementation process in Vietnam, 8 issues of National position; Management; Legislative framework; Regulatory framework; Human resource development; Radioactive waste; Site survey, site selection and evaluation; and Environmental protection in the first two phases need to be early studied and proposed the plan for filling gaps due to the order of the project work and to timely arrange time for preparation of the capacity building, overcoming and completion activities.

## **PURPOSE**

The purpose of the task is to assess 8 issues of the national nuclear infrastructure for the new research reactor project at the pre-project and project formulation phases (phase 1&2) to propose an action plan that the Government, regulatory body, operation organization and related organizations need to implement to complete the national nuclear infrastructure for the new research reactor project in Phase 1&2, step by step meet the conditions of project implementation for each phases as well as meet the requirements of nuclear safety, security and safeguards in accordance with the international standards.

## **CONTENTS**

According to the objectives set out, the Task implemented three following contents:

First, overviewed for 19 issues of national nuclear infrastructure of a research reactor project.

Second, studied and assessed to find out the gaps on eight essential issues of national nuclear infrastructure for the New Research Reactor Project in Phase 1&2: National position; Management; Legislative framework; Regulatory framework; Human resource development; Radioactive waste; Site survey, site selection and evaluation; and Environmental protection.

Third, summarized and proposed action plans to complete the national nuclear infrastructure on eight essential issues for the New Research Reactor Project in phase 1&2.

## METHODS

The Task studied the IAEA's document on specific considerations and milestones for a research reactor project and assessment of the national nuclear infrastructure to support a new research reactor project.

Conditions and criteria of 8 issues in the scope of Task were focused and applied in assessment for practice of nuclear infrastructure for the new research reactor project in Viet Nam.

The gaps were drawn from assessment and the action plan proposal for filling the gaps was set up bases on these identified gaps.

## RESULTS

Based on the conditions and criteria recommended by IAEA for each issue, at each phase to achieve milestones at the end of each phase, the Task force collected the documents and the actual implementation situation in Vietnam to assess, identify gaps at each issue. After all, the Task force proposed an action plan to complete the national nuclear infrastructure for the new research reactor project covering eight studied issues in Phase 1&2 based on the project's expected progress and identified gaps.

Details of the proposal are shown in the Table below:

**Action plan to complete the national nuclear infrastructure  
over 8 issues for the new research reactor project in Phase 1 & 2**

No.	Issue	Content	Person/ Organization in charge	Completion date
1.	National position	Prime Minister's Decision on the research reactor project: <ul style="list-style-type: none"> <li>- to establish policies on nuclear fuel and radioactive waste management</li> <li>- to establish financial regime and clarify the role and responsibilities of the research reactor owner and operating organization;</li> <li>- to establish legal, organizational and financial arrangements for nuclear compensation, decommissioning and management of radioactive waste;</li> <li>- to ensure stakeholder participation in the research reactor project;</li> <li>- to establish policy for the participation of domestic industries in the research reactor project;</li> <li>- to ensure the national program on safety of nuclear fuel and State System of Accounting for and Control of (SSAC) nuclear material</li> </ul>	MOST formulates and submits to the Prime Minister for approval	2018

		are efficiently developed and implemented - to ensure the programs for the nuclear material and nuclear facilities physical protection are developed, established and implemented; - to ensure the radiation protection programs and emergency response plans are established and implemented;		
2.	Management	- Strengthen Steering Committee of research reactor project	MOST	8/2017
		- Planning on Training and education for expert, technical officer, operator, manager and leader	VINATOM prepares and submits to MOST for approval	12/2017
		- Establishment for Integrated Management System	VINATOM	12/2018
3.	Legislative framework	- Continuing with the Project on revision of Atomic Energy Law 2008	VARANS	12/2018
		- Formulation of Circulars and Guidelines related to Research Reactor Project	VARANS	2017-2019
		- Study on ability of adherence to 1997 Vienna Convention, Convention on Supplementary Compensation for Nuclear Damage	VARANS	2019
4.	Regulatory framework	- Setting up a Plan on strengthening for manpower of regulatory body	VARANS	2017
5.	Human resource development	- Setting up a Training program	VINATOM	2018
		- Setting up a recruitment program	VINATOM	2018
		- Adding manpower demand into bid requirements	Project Management Board	2018
6.	Site survey, site selection and evaluation	- Completing study on site characteristics	Project Management Board	2018
		- Submitting dossier for site approval	Project Management Board	2018
7.	Environmental protection	- Additional study for the Environmental Impact Assessment Report	Nuclear Research Institute	2017-2018
		- Setting up plan and development for the environmental monitoring	Project Management Board	2017

		system at site		
		- Guidance for the content of Environmental Impact Assessment Report and enhance capacity of environmental regulatory body	VARANS/ VINATOM coordinate with Depart. of Environment of MONRE	2017
8.	Radioactive waste	- Capacity building for radioactive waste management	VINATOM	2018-2025

*MOST: Ministry of Science and Technology*

*VINATOM: Vietnam Atomic Energy Institute*

*VARANS: Vietnam Agency for Radiation and Nuclear Safety*

*MONRE: Ministry of Natural Resources and Environment*

## CONCLUSIONS

Vietnam's new research reactor project has its own particularity, it is a part of the Project on Construction of Center for Nuclear Science and Technology. The time-frame for project preparation is challenged due to the decision of the National Assembly on suspending the nuclear power project. The site selection is also in trouble by the disagreement of Lam Dong Province Government on the potential site in Precinct 12, Dalat City. All of these factors slow the progress of the project and create unique features for the new research reactor project in Vietnam. The signing of the Inter-governmental Agreement between the Government of Vietnam and the Russian Federation on construction for the Center of Nuclear Science and Technology on the territory of Vietnam was supposed to be the Government's commitment to a new research reactor project under which nuclear infrastructure of Viet Nam has generally reached milestone 1 according to the IAEA criteria but so far, due to the new situation, more confirmation from the Government is needed.

By studying and evaluating the current situation of nuclear infrastructure for the new research reactor project in Vietnam on eight issues in phase 1 & 2, it is concluded that:

- Separate assessment for 8 issues of infrastructure shown that the issues management and human resources are still in Phase 1; and the issues are in Phase 2 including National position; Legal framework; Regulatory framework; Site survey and site selection; Environmental protection and radioactive waste.

- To complete the issues in phase 1 and towards the completion of Phase 2 in the national nuclear infrastructure for the research reactor project, the Task Force recommends considering the proposals action plan presented above.

The assessments resulted from this Task may also be useful references for the Project Preparation Board/ Project Management Board to carry out the necessary actions for the Center Construction Project.

In order to provide a comprehensive assessment for nuclear infrastructure issues for the research reactor project, the Task Force proposes to implement the follow-up task in 2017 on the remain 11 issues. Thus, a comprehensive and systematic assessments of nuclear infrastructure for the new research reactor in Vietnam will be used to smoothly carry out a new research reactor

project as well as use as material in coordination with the IAEA in the case of IAEA mission to Vietnam for national nuclear infrastructure evaluation./.

## **REFERENCES**

- [1] Specific Considerations and Milestones for a Research Reactor Project, IAEA Nuclear Energy Series, No NP-T-5.1, 2012.
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- [3] Report on study for proposals on some issues of the national nuclear infrastructure for the New Research Reactor Project in phase 1&2, 2016, Cao Hong Lan, et al.