BUILDING THE STRATEGIC ACTION PLAN OF VIETNAM ATOMIC ENERGY INSTITUTE DURING 2014-2019

Hoang Sy Than[1], Tran Chi Thanh[1], Nguyen Hao Quang[1], Nguyen Nhi Dien[1,2], Nguyen Viet Hung[1], Tran Ngoc Toan[1], Mai Dinh Trung[1], Trinh Van Giap[3], Vu Tien Ha[4], Nguyen Huu Quang[5], Nguyen Van Mai[6] and Tran Khac An[7]

[1] Vietnam Atomic Energy Institute

[2] Dalat Nuclear Research Institute

[3] Institute for Nuclear Science and Technology

[4] Centre for Non-Destructive Evaluation

[5] Centre for Application of Nuclear Technique in Industry

[6] Centre for Nuclear Techniques in Ho Chi Minh City

[7] Centre for Research and Development of Radiation Technology

Project information:

- **Code: HD-16/HD/NVCB**
- **Managerial Level: Ministry**
- **Allocated Fund: 310,000,000 VND**
- **Implementation time: 12 months (Jan 2013- Dec 2013)**
- **Contact email: hsthan@vinatom.gov.vn**
- **Paper published in related to the project: (None)**

ABSTRACT: In the Decisions by the Prime Minister in the Strategy on Peaceful Utilization of Atomic Energy up to 2020, Vietnam Atomic Energy Institute (VINATOM) was assigned as the Technical Support Organization of the nuclear power projects; and as a key role-player in the decision-making process and in building the national nuclear power infrastructure. Therefore, Building the Strategic Action Plan (SAP) is necessary when VINATOM in present is facing several challenges of varying importance. This report will show the SAP of VINATOM during 2014-2019. The goal of SAP is to develop VINATOM up to the regional advanced level in the field of atomic energy application, such as radiation application, nuclear power and train human resources. The plan of Organizational development, Implementation roadmap and Implementation Solutions of SAP is presented in this report.

Keywords: *SAP, VINATOM.*

I- INTRODUCTION

Vietnam Atomic Energy Institute (VINATOM) is the national nuclear institution, under The Ministry of Science and Technology (MOST), for research, development, technical support, human capacity building and provision of technical services in the field of nuclear energy application in general and in nuclear power in particular.

The duties of VINATOM cover the three major components of its portfolio- nuclear power and non-nuclear power applications as well as coordination of nuclear matters at national level, in the following manner:

a) In nuclear power field: to acquire, master and develop nuclear reactor technology, nuclear island equipment, nuclear fuel, reactor materials; treat radioactive waste and manage spent nuclear fuel; as well as human resources development for Nuclear Power Plan (NPP) as provided for in the Law on Atomic Energy (master training, doctoral training, advanced training and certificate training);

b) In non-nuclear power field: to build technical and scientific capacities for ensuring safe and effective use of radiation ionizing in potential socio-economic sectors of Vietnam, including human health, agriculture, industry, environment, water resources, and to provide relevant nuclear services and products in these fields to national end-users;

c) Advisory and coordinating role at national level: to coordinate and develop international cooperation in the field of atomic energy as assigned by MOST, provide technical advice and implement bilateral cooperation activities with foreign nuclear organizations in the field of Research & Development (R&D), technical support and personnel training.

The organizational structure of VINATOM consists of three main entities: Department of Administration and Personnel, Nuclear Power Development and Technical Support sector, and Research & Development of Radiation Application sector, with the latter being home to the nine R&D affiliates, all located in Hanoi, Dalat and Ho Chi Minh City.

Specific areas of competence of VINATOM in nuclear science and technology include radiopharmaceutical production and distribution, radioactive waste management, economic and technical analyses of radioactive ores and nuclear fuel cycle, Non-Destructive Testing (NDT) services, human capacity building, environmental monitoring and preservation, safety analysis of nuclear activities, and technical assistance to end-users in these fields.

On November 25th, 2009 Vietnam's National Assembly approved the Government Plan on the implementation of the Ninh Thuan Nuclear Power Plant Project [1]. Therefore, in the field of nuclear power, VINATOM started preparing itself to play the role assigned to it by the government of Vietnam in the Strategy on Peaceful Utilization of Atomic Energy up to 2020 [2, 3] (Decision by the Prime Minister in 2006 and 2010), not only as the Technical Support Organization (TSO) but also as a key role-player in the decision-making process and in building the national nuclear power infrastructure.

The infrastructural capacity of VINATOM is supported by a core of scientists, engineers and technicians consisting of:

- Professor, associate professor: 10
- Doctor/ PhD: 40
- Master/ MA: 70
- University Graduate: ~ 450
- College Graduate: 5
- Technicians and clerks: ~ 225
- Total: ~ 800

In fulfilling its mandatory functions, VINATOM relies almost entirely on government financial support, which is complemented by income generated from some nuclear services in NDT and analytical services as well as radiopharmaceuticals products delivered to the medical sector. Like many other national nuclear institutions in developing countries, VINATOM is facing several challenges of varying importance; some of which are specific to Vietnam and others are rather inherent to the nature of the business. Therefore, building the Strategic Action Plan (SAP) during 2014-2019 is very important task of VINATOM in the present. This plan will be applied for all units which are under VINATOM.

II- PROSPECTS OF VINATOM IN FUTURE

VINATOM is currently standing at a critical point in its history in view of the government's decision to establish a new Centre for Nuclear Energy Science Technology (CNEST) and to pursue

a national nuclear power program [1]. The CNEST will be based on a Russian supplied research reactor with supporting infrastructure. The new Centre is intended to provide the foundation for the future nuclear power developments in the country.

VINATOM recognizes the need for transformation to gain the necessary strengths and ability to respond effectively to this new development context. The change initiative will be guided by VINATOM's mandatory functions, stakeholder requirements as well as the national environment in which it will operate, and this will include short term, medium term and long-term strategic goals and actions.

In the short term, VINATOM has to address several goals; such as:

- Select research groups and train them so that they can handle the tasks assigned to VINATOM under the nuclear power program,
- Define the Terms of Reference for the new nuclear research Centre (CNEST), and start the related Feasibility Study (FS);
- Develop adequate human resources for VINATOM and for CNEST, including educations and training curricula ad well as teaching facilities;
- Defining the requirements for and selection of appropriate nuclear power technology for the next two NPPs; and
- Establishing a group for consulting services for the Ninh Thuan 1&2 NPP projects

In the medium term, VINATIOM is determined to achieve a high level of visibility nationally and regionally, firstly by positioning itself as a key role-player at the policy and decision-making level regarding all matters pertaining to nuclear science and technology and nuclear power, secondly, by grasping the opportunities offered to it as the major TSO for the nuclear power program in Vietnam, and thirdly, by winning and maintaining the satisfaction of the national end-users through the provision of high quality nuclear services and products to the national end-users.

In the long term, VINATOM intends to reduce its dependency on the government funding, position itself as a knowledge-based organization in the field of nuclear science and technology, with modern management practices, safety culture, core values and civil responsibilities, thereby achieving high credibility within its internal and external stakeholders.

III- THE STRATEGIC ACTION PLAN OF VINATOM

III.1 Objectives

To build and develop VINATOM up to the regional advanced level [4], acting as:

- A hi-tech research and development agency in the field of atomic energy, functioning to promote radiation application, develop nuclear power and train human resources.
- An independent national technical assistance agency in charge of quality inspection and assurance, safety and security assurance and environmental protection for nuclear power development.

III.2 Tasks

- To develop modern radiation application research directions so as to effectively implement and transfer radiation and radioisotope application technologies in various socio-economic sectors, aiming to create high-quality import substitution products and assuring the competitive production and business as well as export of a number of basic products.
- To form and develop application-oriented basic research directions in nuclear science.

- To build and develop capacity for absorbing, mastering and developing reactor technologies and facilities of nuclear island in nuclear power plants and technologies for handing and processing radioactive ores and rare elements, nuclear fuel and reactor materials; and for management of radioactive wastes and spent nuclear fuels.

- To build and develop technical assistance capacity to inspect and assure the quality of nuclear power plants and their equipment and to assure nuclear and radiation safety and radioactive source security; radiation and nuclear measurement standards: radioactivity observation and environmental impact assessment; and radiation and nuclear incident response techniques up to international standards, thus meeting the requirements on the national nuclear power technical assistance agency.

- To build capacity for training human resources in atomic energy to meet development requirements of VINATOM and related organizations.

- To develop a system of science and technology businesses operating in the field of radiation application and nuclear power technical services.

III.3 Organizational development

- Regarding nuclear power technologies and application-oriented basic researches: To build a nuclear science and technology center which will absorb nuclear power technologies and conduct high-level atomic energy researches and, at the same time, act as the focal point in future cooperation with other countries In nuclear power technologies.

- Regarding technical assistance: To develop the Institute for Nuclear Science and Technology into a technical assistance agency in charge of safety and security assurance and environmental protection for nuclear power development; to develop the Center for Nondestructive Evaluation into a technical assistance agency in charge of inspection and assurance of the quality of nuclear power plants and their equipment.

- Regarding radiation application: To build 4 radiation application institutes in Hanoi, Ho Chi Minh City, Da Nang and Da Lat to serve the implementation of detailed master plans on development of radiation applications in various socio-economic sectors in different regions in the country.

- Regarding human resource training: To develop the Nuclear Training Center in Hanoi into an institution to train human resources in atomic energy for VINATOM and related agencies.

- Regarding technology transfer and services: To develop the Technology Application and Development Company and form science and technology businesses to transfer technologies and carry out production and service activities in the field of radiation application, supply radiation and nuclear equipment and radioactive sources, design reactors, supply nuclear fuels, handle and process radioactive ores and rare earth, and manage radioactive wastes and spent nuclear fuels.

III.4 Implementation roadmap

During 2014-2020:

- To complete the construction of CNEST and put it into operation to serve nuclear power technology research and development activities. The center will have a new high-capacity research reactor and a synchronous laboratory for researching into nuclear power plant designs, nuclear fuel designs, radioactive waste treatment and reactor materials, and modem laboratories on atomic energy utilization in the fields of materials science, biotechnology and medicine.

- To further invest in radiation application institutes in Hanoi, Da Nang, Da Lat and Ho Chi Minh City up to advanced levels.

- To enhance technical assistance capacity, meeting the requirement of inspection and assurance of the quality of nuclear power plants and their equipment; analysis, appraisal and assessment of nuclear and radiation safety; radiation measurement standards; equipment appraisal and calibration; environmental impact assessment, and radiation and nuclear incident response, in preparation for the safe operation of the first nuclear power plant.

- To implement the master plan on the national environmental radioactivity observation and warning network and formulate and implement an investment project to build an operational center, regional stations and a national data center within the framework of the Comprehensive Nuclear Test Ban Treaty (CTBT).

- To complete the construction of an environmental radioactivity observation and warning administration center and regional stations and put them into operation so as to effectively manage the operation of the national environmental radioactivity observation and warning network.

- To complete investment in the nuclear training center to reach an advanced level and be capable of performing assigned training functions and tasks. To continue implementing plans on training human resources to meet development requirements of VINATOM as well as the demand for highly qualified human resources in atomic energy research, development and utilization as well as safety and security assurance, prioritizing those who are specialized in absorbing nuclear power technologies transferred to Vietnam and conduct appraisal for the grant of nuclear power plant operation licenses.

- To expand and develop science and technology businesses which can create a number of radiation and radioisotope application products, technologies and equipment for the domestic market and export; to import nuclear fuels and prepare capacity for absorbing nuclear fuel manufacture technologies, searching and exploring a site for the construction of the national radioactive waste storage establishment and step by step approaching nuclear power plant designs.

During 2020-2030:

- To increase capacity in researching into nuclear reactor designs, nuclear island equipment as well as the capacity of the national low- and medium-activity radioactive waste burial and storage establishment so as to be able to join foreign partners in designing the other nuclear power plants in the country.

- To build a system of synchronous and modern Laboratories on radioactive waste treatment and research into the management of long-lived and high-activity radioactive waste.

- To increase capacity in researching into technologies to produce nuclear fuels from imported enriched uranium, serving the import of a nuclear fuel production chain into Vietnam.

- To increase technical assistance and human resource training capacity to meet the requirements set down in the Orientations for planning nuclear power development through 2030 and detailed master plans on development and application of radiation in various socioeconomic sectors.

- To increase the capacity of science and technology businesses to turn out radiation and radioisotope application products, technologies and equipment for the domestic market and export; design nuclear power plants; produce nuclear fuels and build a national radioactive waste storage establishment.

IV- IMPLEMENTATION SOLUTIONS

IV.1. Mechanisms and policies

a) To complete the formulation and promulgation of a system of mechanisms, policies and legal documents On science and technology development, occupation-based preferential allowances

for employees of atomic energy research and development and technical assistance institutions, and radiation disease diagnosis and treatment establishments.

b) Research institutes, universities, businesses, scientists and technologists, businessmen, organizations and individuals engaged in atomic energy science and technology development activities will be entitled to the highest incentives regarding loans, credit, tax, land use rights, demand stimulation policies and other relevant policies according to current state regulations.

IV.2. Investment and finance

a) To increase and diversify investment capital sources for the effective and timely implementation of the scheme.

b) To use state budget funds as follows:

- State budget development investment capital and foreign assistance shall be used for investment in non-business science and technology, health and training units involving in the scheme implementation.

- Annual non-business funding sources: Non-business science and technology funding sources shall be used for the performance of science and technology tasks and implementation of science and technology programs on atomic energy; non-business education and training funding sources shall be used for training human resources in atomic energy; and non-business healthcare funding sources shall be used for the operation of the radiation disease emergency and treatment system.

IV.3. Human resources

a) To recruit and train sufficient human resources to meet development requirements of VINATOM, paying special attention to human resources for nuclear power research and development and technical assistance.

b) To attach importance on the employment of highly qualified specialists who are Vietnamese or overseas Vietnamese and international specialists in atomic energy training.

c) To concentrate on setting up leading research groups and training highly qualified specialists and technicians.

IV.4. International cooperation

a) To expand and intensify bilateral and multilateral cooperation with foreign countries, organizations and individuals in the field of atomic energy.

b) To take the initiative in elaborating and implementing programs and projects on international cooperation, especially with countries with an advanced nuclear industry so as to make use of their assistance in terms of experiences, intellectual and financial resources and investment so as to develop atomic energy science and technology in a fast, strong and sustainable manner in Vietnam.

c) To combine international cooperation in building nuclear power plants with nuclear power research coordination, technology transfer and human resource training.

V- CONCLUSIONS

In conclusion, the Strategic Action Plan of Vietnam Atomic Energy Institute during 2014-2019 has been developed through the Research Project supported by the Ministry of Science and Technology. This plan includes the SAPs of VINATOM's units. For any strategic plan or program to succeed, there must be an efficient and effective system for constantly MONITORING and EVALUATION of the progress. Similarly for this SAP, Monitoring will be done in order to continuously review the inputs delivery and implementation progress of the planned activities. This

will enable prompt intervention and mitigation measures to be taken. Further an Evaluation to qualitatively and quantitatively assess the SAP performance will be constantly done in order to determine the effectiveness of the impact. Both monitoring and evaluation processes will need the involvement and participation of VINATOM's units.

REFERENCES

[1] Resolution 41/2009/QH12 dated 25 November 2009, the Vietnamese National Assembly approved investment in the Ninh Thuan Nuclear Power Project.

[2] Decision No. 01/2006/QĐ-TTg, 03/01/2006, approving the strategy for peaceful utilization of atomic energy through 2020.

[3] Decision No. 957/QĐ-TTg, 24/6/2010, approving the master plan on peaceful development and utilization of atomic energy through 2020.

[4] Decision No. 265/QĐ-TTg, 5/3/2012, approving the Scheme on "*Building Research and Development and Technical Assistance Capacity for Atomic Energy Development and Utilization and Safety and Security Assurance*".