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COUNTRY REPORT OF VIETNAM

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I/ Strategy and Implementation of Human Resource Development

1. State Nuclear –related Organizations/Agencies:

After the reorganization of the Government of Vietnam (of the term 2007-2012) with 22 ministries, the two Ministries have been designated to take the major responsibility for the development of nuclear energy for peaceful purposes in Vietnam: the Ministry of Science and Technology (MOST), which still keeps its original organization system and the Ministry of Industry and Trade (MOIT), which has been established by merging the Ministry of Industry (MOI) and the Ministry of Trade (MOT). Besides them, there are other relevant nuclear–related ministries, each of them is in charge of certain areas of nuclear energy applications, such as: Ministry of Natural Resources and environment (MONRE), Ministry of Construction, Ministry of Health (MOH), Ministry of Education and Training (MOET), Ministry of Agriculture and Rural Development etc.

2. Long-term Strategy of Peaceful Utilization of Nuclear Energy up to 2020 and the Master Plant for the Implementation of the Strategy:

After signing the decision for the approval of the above-mentioned Strategy, the Prime Minister of Vietnam has signed a decision to approve the "Master Plan for Implementing the Strategy of Peaceful use of Nuclear Energy up to 2020"(23 July 2007). The Master Plan consists of 23 projects, which will be implemented by relevant organizations and agencies. Among them are some main projects as follows:
+ Project for Nuclear Power Development: It aims at the construction and operation of the first nuclear power plant (NPP) by 2020 with two units of 1,000 MW.
+ Project for the Development of Vietnam Atomic Energy Commission (VAEC): It aims at the building of a new advanced multi-purpose nuclear research reactor.
+ Project for Nuclear Human Resources Development: It focuses on the education and training of man - power in the field of nuclear science and technology.
It is clearly emphasized in both the Strategy and the Master Plan that on of the main goals of the national program for nuclear energy for peaceful purposes are to build and put the first nuclear power plant into safe operation and efficient exploitation; to widely and efficiently apply radiation and radioisotopes in various economic and technical branches,

which actively contribute to economic growth, meet social demands for public health care, environmental protection and sustainable development.
Those objectives and goals of the Strategy and Master Plan can be achieved only if appropriate efforts are made by all the stakeholders and the willingness and determination of the Government, with the effective collaboration and assistance from international nuclear community. During the implementation of those 23 Projects mentioned in the Master Plan, Human Resource Development is always considered one of the decision-making factors. The Ministry of Education and Training (MOET) will be responsible for setting up and implementing the National Nuclear HRD Program, which covers both HRD for nuclear power and non-power application areas. However, other ministries, especially the MOST and the MOIT must be deeply and efficiently involved in this project. This Project is now still under review and is expected to be approved soon.

3. Priority areas of HRD and national HRD Programs:

3.1. Status of the Nuclear HRD Program

Historically, VAEC and EVN have a close cooperation with counterparts from Japan, France and Korea to prepare the nuclear HRD program for nuclear power in Vietnam.-VAEC and EVN have already completed the program and submitted to the Government together with the Pre-FS report of the first NPP project. The Government is now considering to approve the program. Meanwhile, nuclear related organizations including utilities, regulatory bodies, technical supported organizations, nuclear R&D institutions, nuclear universities,…are actively preparing their nuclear human resources based on the guideline of the nuclear HRD program.

At present, the MOET has been assigned to set up a National HRD Program which covers all the nuclear HRD tasks. Details are as follows:

- For the First NPP project: Vietnam Electricity (EVN) has prepared the HRD sub-program for the first NPP project (project management, procurement, construction, operation, maintenance,…).

- For Development of National Nuclear Infrastructures: VAEC has prepared the HRD sub-program for development of nuclear infrastructures, focusing on nuclear experts for regulatory bodies, technical supported organizations, R&D activities, nuclear education and training organizations.

- For Development of Applications of Nuclear Techniques: VAEC in collaboration with related ministries takes part in training scientists and technicians to expand applications of nuclear techniques into socio-economic branches of the country .

3.2. National Nuclear HRD Programs:

According to the Master Plan, Vietnam has to make great efforts to successfully completed the National Nuclear HRD Programs, which mainly focused on:

3.2.1 Setting up and implementing a plan for human resource development for the nuclear power program.

- Objectives: To meet the requirements for manpower for nuclear power development program

- Contents: To build education and training establishments; to work out a national plan on development of human resource, including the contingent of experts, technicians and skilled workers meeting the requirements of nuclear power development program; to concentrate on training and raising professional qualifications of managerial and technical personnel as well as skilled workers in the field of nuclear power.

3.2.2 Training and developing manpower on nuclear science and technology in service of research, application and management

- Objectives: To ensure the provision of the contingent of experts, technicians and skilled workers so as to effectively meet the requirements for research, development and application of radiation energy, nuclear power-related technologies and assurance of radiation protection and nuclear safety.

- Contents: To set up a plan for building up the network of education and training establishments of both graduate and postgraduate degrees, advance education, re-education, professional education and training, specific topics-aimed training with relevant professional certificates to be given. To upgrade technical and material infrastructure, set up education and training programs, build up forces of educational personnel and organize the education and training in accordance with the above-mentioned plan.

3.2.3 Consolidating and developing the Vietnam Atomic Energy Commission

- Objectives: To consolidate and develop the Vietnam Atomic Energy Commission into an advanced R&D institution in the field of atomic energy order to make it to be equal to other advanced countries in the region.

- Contents: To make long-term planning for the development of the Vietnam Atomic Energy Commission; upgrade its current laboratories; establish science-technology-production complexes equipped with modern radiation equipment and machines and interdisciplinary laboratories; build up a new and multi-purpose nuclear research reactor of high capacity and a system of modern specialized laboratories for carrying out specific researches; lay the solid material and technical foundation of scientific and technological public information activities in the field of atomic energy.

The task of human resource training and development should cover clear training plans, targets and modes in order to meet the personnel demand of different agencies involved in the long-term nuclear power development program (state management agencies, R&D institutions, technical support, training and education organizations, industrial establishments and nuclear power plants owner) and to enhance capacity of nuclear power training and education organizations.

The National HRD Program have been set up and now is under review process before approved by the Prime Minister, hopefully in this year.

3.3. Priority areas of HRD:

- Training and development of human resources for nuclear engineering : Research Reactor, Nuclear Power Reactor: Reactor design and engineering, Nuclear safety,

- Training and development of human resources for radiation and isotope applications (in medicine, agriculture, industry etc..)
- Training and development of human resources in the fields of Radiation safety and radioactive waste
- Training and development of human resources for nuclear administration: Public Information for nuclear power

II. Nuclear HRD activities in Vietnam:

1. Vietnam Atomic Energy Commission (VAEC) and its role in HRD

Recently, there have been reorganization in the VAEC, and as a result, so far the VAEC has consisted of the following branches:

a) Headquarter:
- Department of Administration and Personnel
- Department of Planning and R&D Management
- Department of International Cooperation

b) Institute for Nuclear Science and Technology (INST)
c) Institute for Technology of Radioactive and Rare Elements (ITRRE)
d) The Hanoi Irradiation Center
e) Dalat Nuclear Research Institute (NRI)
f) Center for Nuclear Techniques (CNT) in Hochiminh City
g)Center for Research and Development of Radiation Technology (VINAGAMMA) in HCM City
h) Center for Application of Nuclear Techniques in Industry (CANTI) in Dalat
i) Nuclear Energy Application and Development Company and
k) The Center for Non-Destructive Evaluation (NDE)

At present, VAEC has 744 staffs, including: 7 Associate Professors and PhD, 55 staffs of PhD Degree, 85 staffs of Master Degree and 398 staffs of university degree.

In regards to National Nuclear HRD Programs, there are 7 ministries/institutions and universities are involved in formulation and implementation of this Program, among which the MOET will take the key role in the program together with other relevant agencies such as: Vietnamese Academy of Science and Technology (VAST), HUT, HUS, Dalat University, Ho Chi Minh University of Natural Sciences, Electricity Power University (EPU) and VAEC.

2. HRD activities in nuclear field during 2007-2009

- VAEC has set up a project on development of the VAEC up to the year 2020, which covers the issue of human resource development. The project has been submitted to the Minister of Ministry of Science and Technology and will be approved in 2009. Under this project, a Nuclear Training Center is planned to be established. The facility of the training center was completed in August 2008 and has been put in operation since then. The Training Center will be used for the specific training courses such as:

+ The training courses on basic knowledge on nuclear for those who will participate in the National Nuclear energy development Program;

+ The Training Courses for updating nuclear knowledge for those who are working in the nuclear field

+ Professional Group Training on specific topics for experts who work on nuclear safety, radioactive waste management, radiation safety etc.

+Short Training Courses on specific topics in nuclear fields.

The VAEC has a plan to invite foreign experts to come and give lectures for Vietnamese trainees here in 2009 and afterward.

- During the period 2007-2009: 02 nine-month training courses have been organized in this training center, in which 40 young staff and university-graduated students were trained on basic nuclear science and technology here. After completing the training courses, they were presented a certificates and were employed to work in the VAEC's institutes (INST, ITRRE , NRI etc.)

- Since 2001, within the framework of the cooperation on nuclear HRD between VAEC and NuTEC (JAEA), annually two training courses on radiation measurement and radiation protection are organized in the Institute for Nuclear Science and Technology (INST) based on the supported equipment by NuTEC /JAEA. So far, 16 two-week training courses have been conducted at the INST with the total of more than 300 participants from various nuclear-related organizations through out the country. In Dalat NRI, 3 training courses on application of nuclear techniques in industry and 01 course on reactor engineering have been conducted with attendance of more than 70 trainees.

- In 2007, the VAEC, in collaboration with EVN and TOSHIBA, organized a two-month training course on Nuclear Power for 34 trainees of EVN. The trainees had seven-week class studying in Hanoi, one-week training in Dalat Nuclear Research Reactor. The trainees who have obtained good results during the training course will be sent to Japan for further training for 4 months on nuclear power. In 2005, the VAEC and EVN also organized a similar training course for 27 trainees on nuclear power. The persons who successfully graduated from the two training courses will be the key persons for nuclear power development program in Vietnam.

- Under the cooperative program between the VAEC, the Hanoi University of Technology (HUT) and TOSHIBA, 03 five-week training courses on nuclear engineering have been completed in the HUT since 2006, and the fourth course is being conducted. Each course was participated in by 30 students coming from the HUT, VAEC, VARANS and EVN. After finishing these courses, some excellent students have been sent to Japan for additional two month training in TOSHIBA. It is expected that such-students will become key persons in the nuclear power development program in Vietnam in the future.

- In universities such as Hanoi University of Technology (HUT), Hanoi University of Sciences (HUS). Dalat University and HochiMinh city University of Natural Sciences (HCM UNS), the faculties of Nuclear physics and Nuclear engineering are planned to be established. Annually, about 20 students graduate from such nuclear-related universities and ready to work in domestic nuclear institutions.

- PhD Education: VAEC is a training institution on PhD education with 5 majors as follows:

+ Nuclear physics
+ Theory and mathematics physics
+ Inorganic chemistry
+ Analysis chemistry
+ Radioactive chemistry

Under this framework, there are 30 students who are studying for their PhD theses in VAEC (including 1 Angola students). 5 students have successfully defended and 3 students are going to defend their PhD theses (including one Angola student) during the period 2007-2009.

III. Roles of International Cooperation for HRD in Vietnam:

1. Through IAEA's Man-Power Development Project: in 2008 there are 28 Vietnamese persons have been trained through IAEA's training courses (15 persons attending short training courses (less than 1 month) and 13 persons attending long training courses (1-5 months) and 49 persons attending International Seminars, Meetings, Workshops

2. Through Regional Cooperative Agreement (RCA): 44 persons attending short training courses (less than 1 month) and 2 persons attending long training courses (1-6 months) and 27 persons attending International Seminars, Meetings, Workshops

3. Asian Regional Cooperative Activities : FNCA as a useful forum for member states to share knowledge and experiences in nuclear field. New HRD tool is FNCA HRD Database and through ANTEP.

4. Bilateral cooperation on HRD

- Bilateral Cooperation with Japan:

+ MEXT Nuclear Scientist Exchange Program: since 1996 (3-10 Vietnamese Scientists were accepted to be trained in nuclear institutions in Japan such as JAEA, NIRS, various universities). In JFY 2008, 06 researchers have been invited to participate MEXT Program In JFY 2009, 03 researchers have been invited to participate MEXT Program. So far, MEXT has been considered one of the most effective channel for nuclear HRD.

+ MEXT International Seminars on Nuclear Safety: they used to be RADA's Training Courses : annually 2-6 Vietnamese experts participated in such courses. Since 2007, those courses have been managed by the JAEA.

+ NuTEC/JAEA: ITP Programs: the so-called "Instructors Training Program, gives a good chance for Vietnamese experts to be trained in Japan for two months, after that they will become instructors/lectures for the training courses in the VAEC on specific topics related to radiation protection, radiation measurement, reactor technology, application of nuclear techniques in industries and radiation and radiological emergency response etc.

Bilateral cooperation with Korea: with KAERI, KINS, KIRAMS, KNS, in which HRD activities have been conducted as a key factor.

Bilateral cooperation with Russia, France and other countries also focuses mainly on HRD.

IV. Progress and implementation of ANTEP

VAEC has been actively contributing to ANTEP as follows:

- Confirmation of the ANTEP needs for 2007 (05 persons were accepted by 2008 MEXT Program).
- Submission of the ANTEP needs for 2008-2009 to the FNCA
- Cooperation on data collection for FNCA HRD database to set up the ANTEP Database on HRD
- Distribution of the Information of the Database to nuclear institutions in Vietnam
- In JFY 2009, 03 Vietnamese researchers of VAEC have been accepted to attend the MEXT 2009 Program
- In JFY 2008, 02 young VAEC's researchers were invited to be trained in JAEA's Plant Safety Courses held in Tsuruga, Japan. 02 other staff will be nominated to apply for the 2009 Plant Safety courses held in Tsuruga –Japan in 2009 and early 2010.

(See the attached tables)

V. Conclusion:

1. In order to strengthen HRD for introduction of nuclear power in Vietnam, the formulation and implementation of a National Nuclear HRD Program is an urgent issue.
2. International Cooperation play a very important role for the implementation of National Nuclear HRD Program in Vietnam. Within the framework of FNCA/ANTEP, the more practical and stronger possible support of FNCA member countries, which have experiences of introduction and operation of NPPs (especially Japan, Korea and China), should be strongly enhanced.
3. Active actions on HRD should be taken as soon as possible such as :
    - Establish a nuclear training center and operate it in effective manner
    - Establish nuclear engineering at universities;
    - Improve the cooperation among national and international nuclear organizations on HRD