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International Cooperation in Nuclear Education

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1. Introduction (1/3)

- November, 2009 Vietnam's National Assembly approved the Government Plan on the implementation of the Ninh Thuan NP Project.
- Ninh Thuan NP Project located at Ninh Thuan province and consists of two component projects named as Ninh Thuan 1 and Ninh Thuan 2 NPPs.
- October 2010, Vietnam and Russia signed an Agreement on Cooperation in Construction of Ninh Thuan1 NPP in Vietnam.
- January 2011, Vietnam and Japan signed an Agreement for cooperation in the development and peaceful uses of nuclear energy.
- October 2011, Vietnam and Japan signed an Arrangement on Cooperation in Construction of Ninh Thuan 2 NPP.

1. Introduction (2/3)

- **Ninh Thuan 1 NPP**
 - Site: Phuoc Dinh Commune
Ninh Phuoc District
 - 2 units x 1,000 Mwe
 - Partner: Russia
- **Ninh Thuan 2 NPP**
 - Site: Vinh Hai Commune
Ninh Hai District
 - 2 units x 1,000 Mwe
 - Partner: Japan



1. Introduction (3/3)

- Many ministries and agencies are involved in Ninh Thuan NP project, of which Ministry of Science and Technology (MOST), Ministry of Industry and Trade (MOIT) are major ministries.
 - **Under MOST:**
 - VARANS: Radiation and nuclear regulatory body;
 - VAEA: Agency for the development and uses of atomic energy; and
 - VINATOM: Institute for research & development, and technical support.
 - **Under MOIT:**
 - EVN (Vietnam Electricity group): owner/operator.
- In addition, Ministry of Education and Training (**MOET**) is responsible for deployment of national project on training and developing human resources in the field of atomic energy, including NP.

2. Human Resources: Current Status

- As a non-nuclear power country, Vietnam's current nuclear human resources still weak in term of quantity and quality, do not meet workforces requirements of Ninh Thuan NP project in almost relevant areas;
- MOST has about 550 staff working at VARANS, VAEA & VINATOM and in 23 specialized areas. Highly qualified staff is not much; lack of experts, especially experts with expertise on NP;
- EVN already established Ninh Thuan NP Project Management Board with 90 staff. But almost staff have no experience on managing a NP project;
- Universities, training centers are lacking in qualified teachers, instructors specialized in NP; and
- Staffs well trained in former socialist countries are aged & retired.

2. Human Resources: Needs

- An estimation on human resources needs of MOST and EVN from now to 2020 is shown in the following table:

	2011	2015	2020
MOST	550	860	1,090
EVN	90	250	2,400

Note:

- ✓ MOST (VARANS, VAEA, VINATOM) workforce demand includes postgraduate and graduate, not only for Ninh Thuan 1&2 NPP projects, but also for radiation application;
- ✓ EVN workforce demand includes different education background (postgraduate, graduate, college, intermediate, technician, unskilled labour...) and only for Ninh Thuan 1&2 NPP projects.

2. Human Resources: Challenges

- Urgent manpower needs versus short time for preparation for Ninh Thuan NP Project;
- National education and training infrastructure and necessary resources are still at low level, do not meet requirements on human resources development;
- Costs for education and training, especially training abroad, are rather high, while national economy is facing many difficulties;
- NP is not so attractive for young generation that it is difficult to enroll qualified students to study NP-related majors, and also to recruit qualified staff;
- Simultaneously implementing two NPP projects with two partners also causes difficulties on manpower preparation.

3. Policies of the Government (1/6)

□ National Plan on Training and Developing Human Resources in the Field of Atomic Energy, period 2010-2020

- Approved August 2010 by the Prime Minister;
- Budget: 3,000 Bil. VND (~ 200 mil. USD);
- Abroad training is urgent and given high priority;
- Domestic training: 5 universities and 1 Nuclear Training Centre in Ha Noi, Ho Chi Minh City and Da Lat have been assigned as implementing institutions and given priority in investment.

❖ Specific Objectives:

➤ For nuclear power projects

- **Each year:** 240 engineers, bachelors, 35 masters and PhDs (including 20 engineers, bachelors, 15 masters and PhDs trained abroad);

3. Policies of the Government (2/6)

- **By 2020:** 2,400 engineers, 350 masters and PhDs specialized in nuclear power (including 200 engineers, 150 masters and PhDs trained abroad).
- **For research, application and ensuring safety and security**
 - **Each year:** 65 engineers and bachelors, 35 masters and PhDs (including 30 engineers, bachelors, 17 masters and PhDs trained abroad);
 - **By 2020:** 650 engineers, 250 masters, PhDs (including 150 engineers, 100 masters and PhDs trained abroad).
- **For universities**
 - **By 2020:** 100 masters and PhDs trained;

3. Policies of the Government (3/6)

❖ Main tasks of MOET, MOST and MOIT/EVN in Nuclear National Education Plan:

➤ MOET

Co-ordinating the implementation of the National nuclear education Plan; Organizing graduate education (students, master and PhD); implementing investment for universities, centres for atomic education & training.

➤ MOST

Planning and organizing manpower education and training for management, ensuring radiation & nuclear safety, security and regulation to meet the needs of development, utilization of atomic energy in general and nuclear power in particular.

➤ MOIT/EVN

Planning and organizing training for workforces needs for the implementation of the first NPP Project in Vietnam, including manpower for the design, construction, operation, maintenance of the NPPs.

3. Policies of the Government (6/6)

❑ Several important policies related to human resources development were issued or to be issued

- Preferential policies on salary of those who are working in the field of atomic energy at state agencies and R&D organizations;
- Policy for attraction and recruitment of experts and excellent graduates;
- Specific policy for people involved in NP project; and
- Policy on recruitment of foreign and overseas Vietnamese experts.

❑ Strengthen and expand international cooperation for human resources development

- Member State of IAEA, RCA, FNCA;
- Signed 7 Inter-governmental Agreements in the atomic energy fields;
- Set up cooperative relationships with other countries;

4. International Cooperation (1/2)

- **IAEA, RCA, FNCA:** Scientific visit, fellowship, meeting, workshop, training course, expert missions to Vietnam.
- **Russia:**
 - In March 2010: MOET and ROSATOM signed MOU on the plan of professional training in nuclear energy;
 - ROSATOM helped to establish an Atomic Energy Information Center at HUST (opened in April 2012);
 - MOET also signed cooperative arrangements with several Russian Universities (St. Petersburg Polytechnic University, Tomsk Polytechnic University, Ural State Technical University...)
 - In 2010 and 2011, MOET dispatched 99 students to study at MEPHI;
 - From 2006 to now, EVN dispatched 25 students to study at MPEI.

4. International Cooperation (2/2)

- **Japan:**
 - JAIF, JAPC, MHI, Toshiba, Hitachi cooperate with some Vietnam universities to organize NP courses for Vietnamese students;
 - JNES annually organizes training courses on regulations for Vietnamese staff in Japan and Vietnam. In 2011, more than 20 staff trained in Japan by JNES.
 - MEXT, JICA Program.
- **Korea:**
 - KAERI, KHNP, KINS Cooperate with VINATOM, VARANS, and some universities to organize training courses in Vietnam and Korea.
 - KOIKA program.
- **USA (USDOE, NRC), Australia (ANSTO, ARPANSA):**
 - Mainly training on safety, security.
- **France (CEA, EDF), India (BARC), Bulgaria (Risk Engineering):**
 - Received Vietnamese researchers to train.

5. Plans for 2012-2015

☐ MOET

- To dispatch 70 students to MEPHI in 2012;
- To implement cooperative arrangements with Russian universities;
- To implement cooperative arrangements with Budapest Economy – Technology University, and Paks NPP, Hungary;
- To sign with the IAEA a Practical Arrangement on education and training;

☐ MOST

- To set up 11 specialized groups and plans to dispatch 130 man.time to train abroad in period 2012-2015, of which 40 researchers will participate in the 2-year training course in 6 important majors.

☐ EVN

- In addition to Russia and Japan, EVN is also considering to dispatch staff to long-term training in other countries.

6. Conclusions

- Vietnam attaches great importance to the human resources development and considers it as a prerequisite condition ensuring successfully implementing NP projects;
- Vietnamese Government has been issuing policies and measures in order for promotion of education and training and attracting workforces for NP projects;
- International cooperation is an very important factor & resource for education and training manpower for NP project in Vietnam;
- Along with strengthening and expanding international cooperation, Vietnam is focusing on efficient uses of international assistance in the implementation of national project on training and developing human resources in the field of atomic energy, in general, and nuclear power, in particular.

Thank you for your attention