

**Asian Network for Education in Nuclear Technology  
(ANENT)**

**Technical Meeting on the Asian Network for  
Education in Nuclear Technology**

**4 – 8 September 2006, Daejeon, Korea**

**Organized by IAEA and hosted by KAERI**

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<p>* Appendixes 3&amp;4 are not included in this report. Please refer to the ANENT website “Activities” at <a href="http://anent-iaea.org">http://anent-iaea.org</a> for them.</p>
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## 1. BACKGROUND

The Asian Network for Education in Nuclear Technology (ANENT) was established in 2004 to assist countries in the Asian region to build capacity, develop human resources, and construct scientific infrastructures through co-operation in education, nuclear knowledge management, and related research and training. During the past two years, two Coordinating Meetings had been organised by the IAEA, of which the first meeting was held in Kuala Lumpur, Malaysia in February 2004 and the second in Hanoi, Vietnam in October 2005. This network was participated in by a number of universities, research centres, government agencies, and other institutions involved in nuclear education and training in the region. Currently there are 28 participating member institutions from 12 countries (Australia, China, India, Indonesia, Malaysia, Mongolia, Pakistan, Republic of Korea, Sri Lanka, Thailand, Philippines and Vietnam) and 6 international and regional networks as collaborating members.

## 2. OVERVIEW OF THE MEETING

### 2.1 Objectives

The overall objectives of the Daejeon meeting were to clarify the needs for and methods of nuclear knowledge maintenance and preservation, to review the ongoing ANENT activities, to identify new emerging challenge, and to make recommendations for future coordinated actions.

The Third Technical Meeting in Daejeon was divided into two parts, i.e. Technical Session on Managing Nuclear Knowledge and the third Coordination Committee Meeting. The main objectives of the Technical Session were further to clarify the significance and methods of nuclear knowledge maintenance and preservation and promote better understanding of the ANENT by encouraging extensive attendance of concerned people from member as well as non-member countries. And those of the Coordination Committee Meeting were to review the ANENT's ongoing activities during 2005-2006, and to discuss and develop a concrete Regional Technical Cooperation Project for final adoption and implementation with the participation of National Coordinators.

## 2.2 Conduct of the meeting

Organized by the International Atomic Energy Agency (IAEA) and hosted by the Korea Atomic Energy Research Institute (KAERI), the Meeting was held at KAERI, Daejeon, Republic of Korea, during the period of 4-8 September 2006. The total number of attendees was 34, comprising 3 from the IAEA, 25 from 11 ANENT member countries, and 6 from 6 collaborating or potentially collaborating organizations. The participating ANENT members were China, India, Indonesia, The Republic of Korea (14 persons), Malaysia, Mongolia, Pakistan, The Philippines, Sri Lanka (2 persons), Thailand, and Vietnam. The collaborating or potential collaborating organizations were Dalton University (UK), European Nuclear Education Network (ENEN), Forum for Nuclear Cooperation in Asia (FNCA), Kazakhstan Centre of Nuclear Technology Safety, Moscow Engineering Physics Institute (MEPhI, Russian Federation), and RCA-RO. The list of participants is shown in Appendix 1.

The Meeting was started with an opening session in the morning of the 4th September 2006 (Monday), followed by the three-day Technical Session on Managing Nuclear Knowledge (Monday-Wednesday). The last two days (Thursday-Friday) were devoted to the third ANENT Coordination Committee meeting. Between these two events, the participants had the opportunity to visit KNFC nuclear fuel fabrication facilities, the KAERI nuclear robot lab, and Thermal-hydraulic test facilities. The meeting agenda is shown in Appendix 2.

In the Monday opening session, Ms. Byung-Joo Min, Director of KAERI's Nuclear Training Centre, welcomed all the participants to the Daejeon meeting, which was followed by opening remarks made by Mr. Yanko Yanev, Scientific Secretary, IAEA/NE. Finally, Mr. Sung-Kwang Yang, Director of Atomic Energy Cooperation Division, MOST/AEB, congratulated the holding of the Technical Meeting on ANENT in the Republic of Korea.

Details of the Technical Session and the Third ANENT Coordination Committee Meeting are discussed in Section 3 and 4 respectively.

### 3. TECHNICAL SESSION ON MANAGEING NUCLEAR KNOWLEDGE

In order to achieve the Session objectives, presentations and discussions were made on the following four themes:

- Knowledge Management Issues Facing the Asian Nuclear Community;
- Knowledge Transfer from Centres of Competence to Areas of Growth - Asian Initiatives for Nuclear Knowledge Transfer;
- Networking of Nuclear Education and Training; and
- Practical Experience of Methodology for Knowledge Transfer in Asia.

The presented papers and materials are attached as Appendix 3, and they can be summarized as follows:

#### 3.1 Knowledge Management Issues Facing the Asian Nuclear Community

Participants from the Republic of Korea, Malaysia, Vietnam, and Kazakhstan and the IAEA gave presentations. The presentations gave overviews of the actual situations in Asian countries concerning energy development, nuclear energy prospects, needs of knowledge transfer on nuclear energy, and growing demand in knowledge preservation and human resources development in Asia. A reverberating message was that clean, economic, and stable nuclear energy is an inevitable energy alternative to respond to the growing electricity demand in the region, and it was emphasized that a strategic regional plan for human resources development is required to cope with the potential manpower crisis in the region's nuclear circles. This was followed by discussions further convincing the audience of the importance and needs of managing and transferring nuclear knowledge on a regional basis and of the role of ANENT to urge nuclear technology transfer and innovation in Asia .

#### 3.2 Knowledge Transfer from Centres of Competence to Areas of Growth - Asian Initiatives for Nuclear Knowledge Transfer

Presentations on this second theme were presented by speakers from the IAEA, Republic of Korea and Japan. The participants were brought up to date with the overall nuclear knowledge management activities undertaken by the IAEA and other networks. These activities covered the nuclear knowledge portal, the IAEA gateway to nuclear knowledge resources; regional and global nuclear education networks such as

WNU, ANENT, and ANSN; targeted knowledge preservation projects in critical areas; outreach activities promoted by the International Nuclear Youth Council (INYC) and ICTP; and the role of the IAEA to facilitate the development of nuclear related curricula. The Republic of Korea suggested what it considered the right direction of the ANENT in the future by introducing its historical curriculum development, current framework and major progress already made. It was agreed to specify the following activities as outstanding features: development of the ANENT web portal, establishment of a database, addition of a cyber platform, drafting Master's degree curricula in Nuclear Engineering, and the attempt at applying to Regional Project of Technical Cooperation. It was recognized that the ANENT should primarily focus on web based education and training. A Japanese delegate made a presentation of the objectives and functions of the Asian Nuclear Training and Education Program (ANTEP) initiated by the FNCA. In particular, he explained the basic concept of the ANTEP, which evolves around a network system and partnership of the member countries, to the participants who are not members of the FNCA. Then ways were discussed to enhance close cooperation and effective coordination with related human resources development projects including FNCA and RCA for synergy and complementation with the ANENT.

### 3.3 Networking for Nuclear Education and Training

At the Session Item three, the participants had an opportunity to share experience and information on some of the ongoing nuclear education and training programmes and expanding networking such as the WNU Summer Institute and ENEN. Presentations were also made by participants from the UK, Russian Federation, Vietnam and Sri Lanka. They stated in common that nuclear science and technology is a highly multidisciplinary, highly specialized subject containing highly particular knowledge contents. It was discussed what role networks can play to maintain competence by capacity building and structuring partnerships.

The participants had an opportunity to learn the current activities and the future plans of the WNU Summer Institute aimed to provide a unique educational experience required to build future global leadership in nuclear science and technology. ENEN activities which are closely observed and followed by the participants were of great interest to the audience. Having acquired the experience of developing and offering education and training courses, it was disclosed that the ENEN now wishes to move

out from basic and advanced academic education to define and harmonize professional training programmes directed to industrial and regulatory fields and promote international mutual recognition. It was stated that the ENEN would like to contribute to nuclear knowledge management worldwide through contacts with its sister network ANENT in Asia and the WNU.

A presentation was made concerning some of the great challenges in establishing ANENT reference curricula, including the need to consider several matters more deeply, such as the true role of “reference curricula” and the real needs of the ANENT participation for such activity.

### 3.4 Practical Experience of Methodology for Knowledge Transfer in Asia

Session four had presentations give by participants from the Republic of Korea, Malaysia and the Philippines. This session offered a forum for discussion concerning the needs and challenges of nuclear knowledge transfer from centres of competence to growing areas. It was discussed ways to develop of ANENT Cyber Platform to provide a web based tool for implementation of education and training within the framework of ANENT, to transfer knowledge through ANENT web portal and the future plan for Cyber Platform. A comprehensive presentation on sharing available resources for distance learning was presented outlining the importance of distance learning, modes and advantages of distance learning and materials available in this regard. The possibility of ANENT to be used as an e-learning or cyber platform for distance learning was also discussed. RCA-RO presented the partnership promoting programmes and their activities carried out for nuclear knowledge preservation.

### 3.5 Summary of the Technical Session

Throughout the sessions, it was reaffirmed the need to develop and innovate knowledge continuously and consistently. There was no one to argue against the importance of knowledge management of nuclear technology with “nuclear renaissance” clearly visible on the horizon.

In the closing session, Mr. Y. Yanev, IAEA/NE moderated the discussion on the expected role and contribution of ANENT for knowledge transfer. It was reviewed that the need for knowledge management should be kept simple as it deals with people and Information Technology as a tool. Exchange of ideas on curricula also took place

bearing in mind the differences in educational systems in the region and attempting at understanding what the members recognized as reference curricula. A discussion was taken place on the possibilities and the methodology to make ANENT to develop an attractive way of approach to education and knowledge transfer.

#### 4. THE THIRD COORDINATION COMMITTEE MEETING

The Coordination Committee meeting was attended by ANENT committee members and representatives from potential collaborating organizations, and chaired by Mr. Kyong-Won Han from KAERI.

##### 1.1 Report and Review of ANENT Activities

ANENT Group Activities and country reports were briefly presented in terms of status, achievement, issues and suggestion for consideration with respect to planning future activities. Presented materials are shown in Appendix 4. Suggested activities included pilot test of the developed cyber platform, strengthening database for the exchange of students and teachers, specification of the draft reference curricula, technical areas for distance learning, and revision of the ANENT web-portal. Finally a brainstorming was attempted to figure a SWOT analysis on the ANENT, which is shown as part of Appendix 4.

##### 1.2 Action Plan for TC Regional Project Development

A new four-year IAEA Technical Cooperation project entitled “Supporting web-based nuclear education and training through regional networking” (RAS2006022) was explained by Ms. K. Hanamitsu from IAEA before starting discussion on future plan. The presentation material is shown in the Appendix 4. The TC regional project proposal, seeking for support to the implementation of the ANENT, was prepared in the second ANENT Coordination Committee meeting for submission to the TC. Since then the proposal had been reviewed in the IAEA and turned out to be RAS2006022.

Participants reviewed the new project implementation plan provided by the Scientific Secretary. It was an important opportunity for all members involved to understand the project concept and clarify the objectives and scope of each activity in the plan. In particular, the activities for the first year (2007) were specified in terms of venue and date.

##### 1.3 Conclusion and Recommendations

### 1.3.1 Summary

The importance of nuclear knowledge management and building capacity was recognized throughout the Technical Session on nuclear knowledge management. Potential ANENT areas would include nuclear power engineering, energy planning, nuclear medicine, nuclear knowledge management. Closer interaction and synergy between the existing networks with the ANENT was proposed by attending collaborating members and potential collaborating members.

### 1.3.2 Review of the TC Project Workplan

Workplan of the TC Project on “Supporting web-based nuclear education and training through regional networking” was reviewed. The thoughts and comments were provided on the workplan, which is shown on Table 1. Based on the review, activities for 2007 were specified as follows:

- National Coordinator’s meeting, September/October 2007, Mumbai, India
- Expert Mission on developing guidance for collecting materials, February 2007, IAEA
- Expert Mission on reviewing suitability of available training materials for cyber learning, September/October, 2007, IAEA
- Expert Mission on the development of the cyber platform, March/April 2007, KAERI
- Establishment of a task force for developing reference curricula on nuclear power engineering (China, India, Korea, Pakistan, **Vietnam**), and non-power applications (Indonesia, **Malaysia**, Philippines, Sri Lanka, Thailand). Action plans will be proposed by the task force groups.
- Regional Training Course on nuclear knowledge management, 4<sup>th</sup> quarter 2007, Malaysia
- Fellowships (2 or 3): Wish list will be submitted from ANENT member countries. Potential host organizations/countries were envisaged as IAEA, Korea, Canada, Germany, ENEN, etc.

In the meantime, Thailand expressed its willingness to consider the possibility of hosting either National Coordinators' Meeting or a Regional Training Course in 2008. Also, ENEN showed its interest in the cooperation with ANENT on curricula development and organization of fellowships and regional training courses.

### 1.3.3 Nomination of Chairperson

Mr. Kyong-Won Han from KAERI was re-nominated as Chairperson for the period between the third ANENT Coordination Committee meeting and the fourth meeting (tentatively in September or October 2007).

### 1.3.4 Recommendations to ANENT members

Participants from ANENT member country were advised to take appropriate actions so that each ANENT member country nominates its "counterpart" representing the country for the TC project of RAS2006022.

### 1.3.5 Actions to be taken

The following actions will be taken:

- Completion of the meeting report and circulation of the report among the meeting participants;
- Completion of the TC project implementation plan and circulation of the plan among the meeting participants;
- Facilitating the exchange of students and teachers using database (Activity 2);
- Revision of the ANENT web-portal reflecting comments from the meeting, including the needs from Activity 2.
- Implementation of the TC project workplan for 2007 and the other activities recommended to IAEA and ANENT members.