

**Discussion Summary of Working Group III**  
**Nuclear Science, Technology, and Safeguards**  
**TECRO-AIT Joint Standing Committee Meeting on Civil Nuclear Cooperation**  
**(Argonne National Laboratory, November 4-6, 2014)**

Number of items discussed	23
Closed items	0
New items	0
Merged items	0
Moved from other group items	2
Number of working item after the meeting	23

1. Closed items

None.

2. New items

None.

3. Merged items

None.

4. Moved from other group items

2 items.

5. Highlights:

**AE-NR-D59, "Radiation Protection Training Program."**

(1) NRC provided training course list of 2014.

(2) AEC evaluated but did not send staff to attend radiation protection related courses.

(3) Propose to keep ongoing.

**AE-IN-NR-D64, "Radiation Protection Technical and Regulatory Information Exchange."**

(1) In June 2014, NRC inquired of AEC with four questions pertaining to Taiwan's patient release practices following the administration of iodine-131 to hyperthyroid and thyroid cancer patients.

(2) AEC responded to all four questions in July 2014.

(3) Propose to keep ongoing.

**AE-NR-D65, "Epidemiology Study on Effects of Prolonged Low-dose Radiation Exposure on Residents living in 60Co-contaminated Rebar Buildings in Taiwan."**

(1) The National Health Research Institutes has just completed the data reprocessing and reanalyzing in May; yet, a revised report has not been released for review.

(2) At the 2014 Bilateral Technical Meeting (BTM), AEC presented the status of

the "Epidemiology Study on Effects of Prolonged Low-dose Radiation Exposure on Residents living in <sup>60</sup>Co-contaminated Rebar Buildings in Taiwan", and NRC shared the status of "Analysis of Cancer Risks of Populations Living near Nuclear Facilities".

- (3) Propose to keep ongoing.

**AE-IN-NR-D66, "Administrative Regulation of the Naturally Occurring Radioactive Material (NORM)."**

- (1) This item was transferred from Working Group I to Working Group III.
- (2) Both sides have shared their experience on implementing NORM and TENORM during 2014 BTM in July 2014.
- (3) According to the 4th item of BTM Conference Summary in 2014, AEC has already prepared relevant regulatory background description on Naturally Occurring Radioactive Materials (NORM) and US regulatory issues TECRO wishes to know about.
- (4) NRC and EPA provided NORM information to AEC on October 8, 2014.
- (5) Propose to keep ongoing.

**AE-DE-F39, "TECHNICAL SAFETY SUPPORT."**

- (1) AEC invites NNSA to provide training on Nuclear Forensics in 2015.
- (2) NNSA will attempt to identify resources to provide AEC tools for nuclear forensics self-assessment and a process to identify gaps in forensics response.

**IN-OR-I7, "Production and Evaluation of Isotopes and New Radiopharmaceuticals."**

- (1) In June 7-11, 2014, Dr. KW Chang attended the 2014 SNMMI meeting in ST. LOUIS, MISSOURI and posted research results introducing INER's progress in the nuclear medicine field.
- (2) INER cooperated with Taiwanese Society for Nuclear Medicine and Molecular Imaging (SNMMI) to hold the 2014 Annual SNMMI Meeting from October 31st to November 1st, and invited three U.S. researchers (one from Emory University and two from MD Anderson Cancer Center in Texas) to join the meeting.
- (3) INER invited Professor Ji Chen of Emory University to give a presentation on his research at INER on October 28, 2014.
- (4) Propose to keep ongoing.

**IN-DE-I14, "Information Exchange of Certification, Quality Control and Licensing Procedure of Radiopharmaceutical."**

- (1) In February 2014, INER received a request from Dr. Ho Nam, International coordinator, World Council on Isotopes, Korea Radioisotope Association

for the investigation of the current status of the radiation and radioisotopes practice in Taiwan . The associate researcher, Shiou-Shiow Farn ( TECRO ) has finished the investigation report of the current status of the radiation and radioisotopes practice in Taiwan from 2011-2013 and the report was sent to the Dr. Ho by mail.

- (2) INER proposed two issues, “the consideration of New Drug Application of nuclear medicines in the United States” and “the industrialization of nuclear medicine practice in United States”, to promote the cooperation between TECRO and AIT in 2014. INER wants to learn more about the experience and practice of industrialization for radiopharmaceuticals and critical points of NDA of radiopharmaceuticals in the United States, such experiences are not enough in Taiwan now. We sincerely hope to establish the long-term cooperative channel with the experts and facilitate the development of radiopharmaceuticals.
- (3) INER seeks opportunities to have contact with FDA experts to hold discussions on licensing of nuclear medicine. Also, INER would like to communicate with NIH regarding nuclear medicine industrialization. Dr. Capala of NIH will be point of contact with INER.
- (4) Propose to keep ongoing.

#### **IN-DE-I19, “Cooperative Programs on the Development and Improvement of Nuclear-Imaging Instrumentation Associated Technology.”**

- (1) Prof. Benjamin M. W. Tsui (Johns Hopkins Medical Institutions) was invited to INER to conduct seminars about the radiation imaging physics and medical imaging modeling from Jan. 15 to Jan. 17, 2014.
- (2) Assistant Engineer Ho-Hui Hsieh (INER) was given 5-week training about radiation imaging simulation and physical modeling at Division of Medical Imaging Physics (The Russell H. Morgan Department of Radiology and Radiological Science, Johns Hopkins Medical Institutions) in Baltimore from Mar.1 to Apr. 7, 2014.
- (3) Assistant Researcher Sheng-Pin Tseng (INER) was given 1-week training about imaging parameter optimization technology in carbon nanotube x-ray source array at Otto Zhou Research Lab of the University of North Carolina at Chapel Hill from Sep. 14 to Sep. 19, 2014.
- (4) Propose to keep ongoing.

#### **TU-DE-Y1, “Generation IV Nuclear Reactors.”**

- (1) NTHU team visited JAEA and attended an international workshop on VHTR in April, 2014; the team is also interested in visiting the USA for similar activities.

- (2) NTHU is conducting a research project supported by the government on “Research and International Technical Cooperation for Advanced Nuclear Power Safety Technology” for 2014-2015. Neutronics, thermal-hydraulics, and materials in advanced reactor applications are major areas of interest.
- (3) A follow-up research project for 2015 to 2017 is also under planning.
- (4) NTHU will hold discussions to restart the assignment of researchers from Taiwan at DOE national laboratories.
- (5) Propose to keep ongoing.

**TU-DE-Y3’ “Explore opportunities related to DOE Engineering Innovation Hub for Modeling and Simulation Program.”**

- (1) Two young scientists and one PhD student at NTHU attended a training course in Spain in summer 2014, focusing on neutronics and thermal-hydraulics coupling (NRC-developed computer codes: PARCS & TRACE/RELAP5).
- (2) Propose to keep ongoing.

**TU-DE-Y4, “Formation of New partnership INL/NTHU/INER/NBL for Education and Training in Nuclear Science and Technology.”**

- (1) NTHU graduate student, Mr. W. C. Cheng, went to Massachusetts Institute of Technology, Nuclear Reactor Laboratory for six-month training.
- (2) In 2014, Dr. Richard Johnson (INL staff) visited NTHU and attended a PhD student’s dissertation defense as a committee member.
- (3) Propose to keep ongoing.

**TU-AN-CC1, “Neutron Research at Research Reactors and Spallation Sources.”**

- (1) On March 10, 2014 and Sep. 18, 2014, ORNL neutron scattering scientist, Dr. Wei-Ren Chen visited Taipei and gave talks.
- (2) On Sep. 8-9, 2014, NIST neutron spin-echo instrumentation scientist, Dr. Nagao Michihiro was invited to NSRRC/Hsinchu for a presentation in the small angle neutron scattering workshop.
- (3) Propose to keep ongoing.

**AE-DE-EE2, “International Training Course on Physical Protection.”**

- (1) Mr. June-Yuan Huang, and Dr. Wei-Wu Chao from AEC attended the Security Exercises Workshop, held by WINS (World Institute for Nuclear Security), Feb. 18-21, 2014.
- (2) AEC will dispatch two people to attend ITC-25 in April, 2015.
- (3) AEC appreciates that AIT could provide the exact date and a draft agenda of ITC-25, so that AEC could start the nomination process.
- (4) AIT is pleased to inform TECRO that the dates for the 25th edition of the IAEA International Training Course on the Physical Protection of Nuclear

Material and Nuclear Facilities are April 20 – May 9, 2015, in Albuquerque, NM. AIT will pursue correct channels for letters of invitation. AIT requests that TECRO provide nominees at least 3 months in advance, i.e., January 20, 2015.

- (5) Propose to keep ongoing.

**AE-DE-EE3, “Nuclear Export Control Training.”**

- (1) In June 2014, DOE facilitated a CIT instructors Exchange with Taiwan Customs. This will be followed on with another Exchange in 2015 that will discuss some of the CIT Instruction topics in more depth.
- (2) In October 2014, DOE Provided an Advanced Licensing Training to Taiwan's Bureau of Foreign Trade. This was the second such event designed to assist in building Taiwan's risk assessment capacity for Strategic trade controls.
- (3) Propose to keep ongoing.

**AE-DE-EE5, “Radioactive source security cooperation.”**

- (1) NNSA NA-21 (GTRI) proposes to hold a Regulatory Development Workshop on Radiological Source Security in Taiwan in 2015. AEC prefers for training to be held in April 2015.
- (2) Both sides shall further coordinate for the upcoming regulatory development workshop on source security in 2015.
- (3) Propose to keep ongoing

**AE-DE-EE6, “Physical Protection Consultations.”**

- (1) THOR security measures keep improving.
- (2) Propose to keep ongoing

**AE-DE-EE7, “Training in Implementation of New PP Standards and Guidance.”**

- (1) AEC requested a workshop on Physical Protection Standards and Guidelines for September, 2014, in Taipei.
- (2) AIT arranged for 3 instructors from NNSA to conduct the “Physical Protection Foundations Course” in Taiwan on September 15-18, 2014. It was a successful and useful workshop for participants from utilities, institutes and universities in Taiwan.
- (3) AEC welcomes further cooperation and training in areas of nuclear security.
- (4) AIT would agree to two training workshops to be conducted in 2015 by NNSA: 1) a course on how to conduct Physical Protection System inspection and 2) a course on Physical Protection System contingency planning.
- (5) Propose to keep ongoing.

**AE-AIT-FF1, “State Systems of Accounting and Control (SSAC).”**

- (1) TECRO will send one or two observers to attend SSAC course in 2015.
- (2) The next IAEA SSAC International Training Course will be held on April 26 - May 8, 2015 at Oak Ridge National Laboratory. To send observers to this SSAC ITC, TECRO should contact Scott Purvis at DOE/NNSA (Scott.Purvis@nnsa.doe.gov) and Kyler K. Turner at US-DOS (TurnerKK@state.gov) to provide the names of recommended individual observers at least 3 months in advance, i.e., by January 26, 2015.
- (3) Propose to keep ongoing.

**AE-IN-AIT.LA-FF2' "Cooperation in Safeguards Technology."**

- (1) Limited activities in 2014.
- (2) Propose to keep ongoing.

**AE-AIT-FF3, "Exchange of information on Implementation of IAEA Safeguards and the Additional Protocol."**

- (1) Safeguards information papers were exchanged at the 2014 JSCCNC meeting on November 5, 2014.
- (2) Information on implementing safeguards will continue to be exchanged at future meetings.
- (3) Propose to keep ongoing.

**AE-AIT-FF4, "Inventory of U.S. obligated nuclear material in Taiwan."**

- (1) AEC has sent TECRO on March 13, 2014 with accumulation inventory of all material subject to the current agreement for cooperation as well as individual inventory of Canadian, Australian, and EURATOM flagged materials for 2013.
- (2) AIT received from TECRO, on March 18, 2014, the inventories of U.S., Canadian, Australian, and EURATOM flagged materials for 2013.
- (3) AIT and TECRO have been working together to verify the accuracy of the inventories.
- (4) AIT & TECRO are scheduled to have discussions about the inventories as well as the Administrative Arrangements on December 15-17 in Taipei.
- (5) Propose to keep ongoing.

**TU-OR-HH1, "Design of Medical Therapy Facility for THOR."**

- (1) Limited activities in 2014.
- (2) Propose to keep ongoing.

**AE-NR-Z9, "Response and Management of Radioactive Material Events."**

- (1) This item was transferred from Working Group II to Working Group III.
- (2) AEC shared experiences by giving a presentation titled "Finding and Managing Abnormal Radioactive Materials in Taiwan" during 2014 BTM in Taipei in July 2014.

- (3) AEC requests access to Nuclear Material Events Database (NMED) in order to improve patient safety in Taiwan.
- (4) Propose to keep ongoing.

Approved by:



Ike U Therios, DOE/NNSA

AIT Representative

Date:



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Date: