

**Co-Chairs' Summary Report**  
**ASEAN Regional Forum**  
**2<sup>nd</sup> Nuclear Forensics Workshop on**  
**Enhancing Regional Capacity-building to Strengthen Nuclear Forensics**  
**Bangkok, Thailand**  
**10-12 September 2013**

1. The 2<sup>nd</sup> ASEAN Regional Forum (ARF) Nuclear Forensics Workshop on Enhancing Regional Capacity-building to Strengthen Nuclear Forensics was held on 10-12 September in Bangkok, Thailand. The workshop was co-chaired by Mr. Wayne Mei of the United States, Mr. Klaus Mayer of the European Union, and Ms. Busadee Santipitaks of Thailand.
2. The Workshop was attended by representatives of Australia, Cambodia, Canada, China, the European Union, Indonesia, Japan, Malaysia, Mongolia, New Zealand, Pakistan, Russia, Sri Lanka, Thailand, the United States, and Vietnam. Invited guests also represented the United Nations Interregional Crime and Justice Research Institute (UNICRI), in its capacity as regional coordinator of the EU CBRN Centers of Excellence Initiative, Pacific Forum, Center for Strategic and International Studies (CSIS) and the International Atomic Energy Agency (IAEA).
3. The workshop objectives were to share best practices, examine national capabilities and authorities, and determine opportunities for regional cooperation and capacity building. Participants engaged in multiple small group discussions and table top exercises to achieve the aforementioned objectives. Participants held the view that the participation and expertise of UNICRI, Pacific Forum, CSIS and IAEA greatly enhanced the discussion of future regional capacity building activities.

#### **Introductions and Welcoming Comments**

4. Ms. Busadee Santipitaks, Deputy Director-General, Department of ASEAN Affairs, Ministry of Foreign Affairs of Thailand opened the workshop by welcoming participants, highlighting the importance of nuclear forensics and its relevance to nonproliferation, nuclear safety and safeguards. She noted the importance of networks of excellence to share practices, to work through international frameworks and building national expertise. She also provided a preview of the workshop themes of cooperation and capacity building.
5. Mr. Jordi Carrasco-Munoz of the European Union welcomed participants to the workshop and highlighted the importance of disarmament and safeguards and the EU's contribution to global nonproliferation. He emphasized that security and development were twin pillars of progress and each needed the other to properly take root and flourish in countries. He described the structure of the EU's CBRN Center of Excellence (COE), noted that the COE for Southeast Asia had recently taken root and that the global budget (2009-2013) for the COEs was 95 million euros.

#### **Day One Presentations and Discussions**

6. Mr. Wayne Mei of the U.S. Department of Energy provided a presentation that highlighted the evolution and maturity of nuclear forensics describing milestones since 1995 and emphasized its importance as noted during both Nuclear Security Summit meetings. He also discussed the relevance of nuclear forensics to ASEAN and the ASEAN Regional Forum (ARF). He reviewed the summary and outcomes of the first nuclear forensics workshop in 2011 and the next steps as it related to the current workshop.

7. Ms. Pantip Ampornrat of the Thailand Office of Atoms for Peace provided a presentation on ASEANTOM. The presentation explained that ASEANTOM is a network of ASEAN regulators that was recently established given the ASEAN 2015 community and connectivity goals to ensure countries are properly prepared as countries begin using nuclear power. ASEANTOM was announced and welcomed at the 20<sup>th</sup> ASEAN Summit in Phnom Penh and in 2013 completed its terms of reference. ASEANTOM distinguishes itself from other Asia regional nuclear-focused bodies because it focuses on safety, security, and safeguards and envisions regional activities beginning in 2014. Its proposed scope of activities is to share best practices, build capacity through training, assist members to adhere to IAEA standards and guidelines, exchange information for confidence building measures, forge cooperation in areas such as disaster response, and draw on regional and international expertise.

8. Mr. Klaus Mayer of the European Union Joint Research Center provided an overview presentation on nuclear forensics that focused on establishing common conceptual understandings for the rest of the workshop. The presentation emphasized nuclear forensics as an integral aspect of responding to a nuclear security incident and detailed the process of forensics as well as its scope. The presentation provided some practical context by reviewing traditional forensics and its relationship to nuclear forensics. The presentation highlighted the complexity of nuclear forensics and the difficulty of determining useful patterns and signatures and the opportunities for signature development. The presentation noted the need for core capabilities and outlined the recommended parameters for those capabilities. The presentation related that key facets of core capabilities should be readily available, rapid and efficient, affordable and sustainable and supported through international cooperation.

9. Mr. David Hill of the Australian Nuclear Science and Technology Organisation (ANSTO) provided a presentation that focused on nuclear forensic science as it supports investigations. The presentation highlighted a practical case study from Australia in which radioactive material was found but it was handled without the specialized knowledge of nuclear forensics as well as other nuclear forensics joint activities. The presentation emphasized the need for a national response plan to ensure a proper sequencing during an investigation and crime scene management. The presentation discussed the International Atomic Energy Agency's (IAEA) Model Action Plan guidance document as a basis for such national plans. The presentation also noted the legal sensitivities that may complicate the scientific process and that creating and implementing a national model action plan may require an extended amount of time.

### **Day One Small Group Discussion**

10. Workshop participants broke up into small groups to discuss five discreet topics related to developing effective national nuclear forensic core capabilities. The topics included authorities

and legal frameworks, education activities, technical capabilities, national nuclear forensic libraries and training and building expertise. Participants detailed their own national frameworks, education efforts, technical capabilities and mechanisms to develop/maintain expertise. Participants also offered suggestions for priority areas in each of these topics.

### **Day One Tabletop Exercise**

11. Workshop participants took part in a tabletop exercise which focused on the response process to a gamma alarm triggered by a truck at a border entry port. The scenario pressed participants to detail the standard operating procedure, including secondary inspections, isolation of material, safety measures etc), legal measures/authorities, and procedures and mechanisms to preserve the potential crime scene during and after the initial inspection. Participants then examined the scenario further to identify what equipment would be used, detail how evidence would be identified and preserved, explain what law enforcement capabilities would be needed, when reachback would be called upon and other aspects related to secondary inspection. Participants discussed a national response plan involving law enforcement, emergency management, technical expertise, and ministerial coordination. Participants also gave additional scenario details (type of radioactive material, other evidence found etc.) focused on material characterization and crime scene investigation management and processes. The tabletop exercise also included evidence/material transportation and storage aspects as well as material analysis capabilities in such a scenario. Participants also examined the difference in response if the material was smuggled by train between two countries.

### **Day Two Presentations**

12. Ms. Tegan Bull of the IAEA's Office of Nuclear Security presented on the IAEA's nuclear forensics activities, and resources and assistance it can provide member states. The presentation explained the role and vision of the Office of Nuclear Security and specific assistance the IAEA is able to offer if requested by Member States. The presentation highlighted the IAEA's multiple nuclear security series documents, specifying guidance documents such as one in development on nuclear forensics in support of investigations and the development of a national nuclear forensic library. An overview on current and completed coordinated research projects was also provided. The presentation also described the Incident and Trafficking Database (ITDB), which was established in 1995 and has 124 participating Member States and explained its scope and data products. The presentation summarized ongoing training and capacity building courses and related conferences that discussed nuclear forensics. The presentation also advertised an international nuclear forensics conference to be hosted by the IAEA in 2014.

13. Mr. David Santoro of the Pacific Forum, Center for Strategic and International Studies (CSIS) presented on regional connectivity for nuclear security and nonproliferation in Southeast Asia. The presentation discussed the history and evolution of official regional multilateral mechanisms involvement in nuclear security and nonproliferation issues. The presentation focused on a number of official regional multilateral mechanisms including ASEAN, ASEAN Regional Forum, ASEAN+3, the East Asia Summit and others. The presentation also highlighted non-official mechanisms and their contribution to nuclear security and nonproliferation issues. The presentation emphasized non-governmental organizations and think

tanks including the Council on Security Cooperation in the Asia Pacific (CSCAP) and its multiple study groups and experts groups on nuclear energy and export controls. The presentation noted CSCAP served its recommendations to the ARF and continually seeks to meet ARF needs, hence the recent creation of the nuclear energy experts group given the rising interest in nuclear power in Southeast Asia.

14. Ms. Heather Dion of the U.S. Department of Energy provided a presentation on establishing national nuclear forensics library. The presentation emphasized the importance to establish a baseline to understand what is needed to create a national nuclear forensics library which should be a driver in determining needs. The presentation highlighted the basic process of applying nuclear forensics for evidence and investigations, potential pitfalls during the process and opportunities to leverage a national nuclear forensics library. The presentation described the national nuclear forensics library concept, lessons learned from the United States and its ongoing development of the library. The presentation noted that differing levels of national experience with the nuclear fuel cycle will play a role in the structure of a national nuclear forensics library. The presentation stressed the need for national interagency cooperation and collaboration to possibly include non-government technical experts. The presentation presented additional methods to organize and categorize library data. The presentation also advocated the benefits of information sharing.

### **Day Two Tabletop Exercise**

15. Workshop participants took part in a second tabletop exercise that extended the scenario from the tabletop exercise of day one. Participants examined the scenario which presented potential smugglers/suspects, search and seizure of potential nuclear material, and public health and safety issues. Participants worked through how investigators would proceed through these challenges focusing on aspects of crime scene management and safety. Participants were challenged to further exercise the scenario to the nuclear forensics investigation and analysis phase focusing on how to properly handle evidence, deal with contaminated items, reconcile classical forensics skills/needs with nuclear forensics skills/needs, and detail relevant CONOPs. The scenario also injected information on a specific suspect and asked participants to exercise how to deal with his apprehension and investigate his property. Participants also worked through unexpected injects including triggered radiation alarms during search of the suspect's home and discovery of a potential dirty bomb. The scenario was extended to exercise post investigation questions focused on notification of stakeholders, role of a national nuclear forensics library, role of attribution as well as how to handle transnational and diplomatic implications of a nuclear smuggling event.

### **Day Two Presentations Continued**

16. Mr. David Hill of the ANSTO provided a presentation on the Australian experience of its national needs assessment for nuclear forensics. The presentation noted that Australia was driven by the desire to be prepared for any contingency as it was hosting multiple major international events and initially leverage existing budgets of publically funded agencies to develop nuclear forensics capabilities. The presentation detailed training and research projects and highlighted the importance of crime scene management. The presentation emphasized the

importance of interagency cooperation and policy coordination and the need for operating procedures to withstand stresses of potential incidents of nuclear smuggling. The presentation focused on the importance of smooth cooperation between law enforcement and the scientific community and the need for a national framework, sustainable resources and regular exercise of technical capabilities. The presentation stressed the importance to understand national requirements and recognize its evolving requirements as countries try to establish core capabilities. Participants engaged in follow up discussion that focused on the perils of mixed hazardous materials and challenges of presenting evidence in court.

17. Mr. Wayne Mei of the U.S. Department Energy provided a presentation on program monitoring and metrics and its importance to budgeting for capacity building programs. The presentation established definitions for capacity and capacity building as it relates to program management and assistance and explicitly detailed its value-add to nuclear security goals. The presentation highlighted the traditional aspects of monitoring and evaluation that could be applied to examination of capacity building programs. The presentation emphasized the importance of strategic planning and establishing a program of action to guide effective implementation. The presentation also advocated a model, containing design, intended impacts and evaluation pillars, for evaluating capacity building that could be easily leveraged.

18. Mr. Robert Frank of European Union Mission based in Manila provided a presentation on the Instrument for Stability for the European Union. The presentation provided background on the EU and the Instrument for Stability and its mission, goals, priorities and current capacity building efforts to combat transnational threats in Southeast Asia. The presentation noted the key aims of the EU's external policy are to support stability, promote human rights and democracy, seek to spread prosperity and support the enforcement of the rule of law and good governance. The presentation also noted there are multiple Instruments with different focus areas. The presentation explained the Instrument for Stability that was launched in 2007, has more than 2 billion euros from 2007 to 2013 and expects similar or rising resources from 2014 to 2020. The presentation briefed on various ongoing EU capacity building activities including those focused on maritime security, counterterrorism, export controls and cybercrime.

19. Ms. Maria Eugenia de los Angeles Rettori of the United Nations Interregional Crime and Justice Research Institute (UNICRI), provided a presentation on the Chemical, Biological, Radiological and Nuclear Centres of Excellence (CoE). The initiative, funded by the EU and jointly implemented by the UN and the European Commission's Joint Research Centre, promotes regional coordination, long-term national and regional capacity building for responsible authorities and administrative infrastructures, specific projects, and policy reinforcement in the area of CBRN risk mitigation. The presentation detailed the eight regional secretariats (six of which are established) and the coordination with national focal point as well as the cycle of activities by which projects are submitted and approved. The presentation emphasized the importance and utility of establishing a National CBRN Action Plan to determining and prioritizing national needs. The Southeast Asia regional Secretariat is stationed in Manila and provides a range of administrative and programmatic support for the CBRN COE mission. The presentation also detailed related projects in the regional focused on nuclear and radioactive materials. Participants followed up with questions related to CoE engagement with South Asian countries.

20. Mr. Dim Dawn of Cambodia's Ministry of Defense provided a presentation on Cambodia's national structure to combat CBRN threats and coordinate with the EU CBRN CoE. The presentation detailed the legal authorities related to combat CBRN weapons and the national structure of the general secretariat of the National Authority of The Prohibition of CBRN. The presentation also highlighted the cooperative, coordination and training activities between the Secretariat and the EU CBRN CoE. The presentation focused on a case study featuring the potential discovery of chemical weapons in Cambodia and how the Cambodia government resolved the situation.

### **Day Three Presentations**

21. Mr. Dedik Eko Sumargo of Indonesia's Nuclear Energy Regulatory Agency (BAPETEN) provided a presentation on Indonesia's nuclear forensics and nuclear security response capabilities. The presentation detailed BAPETEN's authorities, role and mission in the regulation of nuclear and radioactive material. The presentation noted the location and types of nuclear facilities in Indonesia and number of licenses granted for radioactive sources for medical and industrial purposes. The presentation highlighted the types of hazards and threats that BAPETEN is concerned about including natural disasters, insider threats and criminal and terrorist acts. The presentation described Indonesia's current national framework (which would be exercised next year) to respond to a potential nuclear security incident or accident involving nuclear or radioactive material and highlighted key responsibilities and capabilities (or lack thereof) by interagency stakeholders. The presentation also noted key challenges, such as the need for more human capacity building question, the centralization of resources in Jakarta, vulnerabilities during the transportation of material etc. The presentation closed with recommendations that focused on capacity building and information sharing. Participants recommended Indonesia invite regional neighbors to the exercise of its national framework.

22. Ms. Kalaya Changkrueng of Thailand's Office of Atoms for Peace provided a presentation on Thailand's nuclear forensics capabilities. The presentation described OAP laboratory nuclear forensics objectives and current staff responsibilities. The presentation noted the current status of Thailand's analytical labs and proposed and highlighted current SOPs in the event of a potential nuclear security event. The presentation highlighted Thailand was participating in an EU CBRN CoE project on upgrading security capabilities of nuclear material and radioactive materials that would help Thailand identify and train a team of nuclear forensics experts and develop a nuke forensics database. The presentation also detailed OAP's future plans for training course, development of a national action plan and international training courses with help from EU. The presentation listed Thailand's challenges going forward, including the need for a stronger security culture and more development of experts.

23. Mr. Yoshiki Kimura of the Japan Atomic Energy Agency (JAEA) provided a presentation on the research and development (R&D) status and future plan of nuclear forensics technology. The presentation described the status of the ongoing project to improve nuclear forensic analysis technologies by focusing on improving impurity measurement, isotope ratio measurement, particle analysis and uranium age determination. The presentation highlighted the progress in accurate testing of each of these measurements. The presentation noted Japan was also

developing a prototype national nuclear forensic library (NNFL) and in the process of populating it with data and testing its practical operation and data handling functions. The presentation also detailed a number of international collaboration projects between Japan and the United State and European Union. The project topics included uranium age determination, evaluation of fuel attributions, development of a NNFL, and information exchanges. The presentation also noted that the R&D project should be completed in 2014 and Japan would share the results with the international community on the implementation of advance nuclear forensic capabilities and development of a NNFL.

24. Mr. David Hill of the ANSTO provided a presentation on international forums related to nuclear forensics. The presentation detailed the history, activities and accomplishments of the Nuclear Security Summits in Washington, DC in 2010 and Seoul in 2012 and noted two upcoming Summits in 2014 and 2016. The presentation described the background of the Global Initiative to Combat Nuclear Terrorism (GICNT) and the activities of its Nuclear Forensics Working Group (NFWG) which was established in 2010 and currently chaired by Australia. The presentation highlighted the goals, outcomes and emerging theme of previous NFWG tabletop exercises and its efforts to raise awareness through information projects. The presentation shared information about the membership, exercise, communications, outreach, guidelines development and training of the International Technical Working Group (ITWG). The presentation also noted the distinctions between and benefits of each of the aforementioned multilateral forums as well as the unique partnership role of the IAEA.

25. Mr. Robert Finch and Mr. Matt Sternat of Sandia National Laboratories (SNL) provided a presentation on collaboration through regional experts meetings and projects. The presentation described projects on nuclear transparency in Asia Pacific and on the Aral Sea Basin (monitoring water quality) in Central Asia. The presentation highlighted the Gulf Nuclear Energy Infrastructure Institute project, the Middle East Scientific Institute for Security and other less formal cooperative R&D on environmental radiation detection stations and radiation measurements cross calibration projects. The presentation emphasized a suggested scope, timing, and outreach/training activities for regional experts meeting. The presentation stressed regional meeting should focus on human capital development, technical capabilities and infrastructure, evidence management, administrative and operational infrastructure and operating procedures and informational support. Participants noted that establishing a network of experts in the near future as described could be premature as basic needs assessments to identify participants and gaps is a much needed first step in many countries. Some participants also sought explicit guidance on how to receive nuclear forensics assistance and join other global nuclear forensics initiatives. Participants wondered how and if within an existing organization would a network of experts be established.

### **Day Three Plenary Discussion**

26. Moderators from breakout discussions on day one summarized common themes that emerged among participants. In the authorities and legal frameworks discussion participants noted the importance of having the proper authority to criminalize nuclear smuggling, grant responders and investigators sufficient powers to successfully respond to a potential nuclear security incident. Participants also identified additional multilateral forums to discuss nuclear

smuggling and the need for technical experts communicate one another. The related educational activities discussion participants noted the need for basic awareness training among front-line officers (and SOPs), awareness training for manager, policymakers and other stakeholders and more in-depth training for technical experts (although to which and in what manner to train experts was debated). There was also different opinions to the extent to which the public needed basic awareness and/or nuclear forensics capabilities. The technical capabilities discussion considered five key areas including incident site, transport, laboratory, (data) interpretation, and cross cutting issues. Participants defined the aspects of the five key areas and examined the current capabilities in the region (which differed on across ARF countries). The national nuclear forensics libraries discussion focused on existing data sources that could be part of a national library, user requirements to leverage existing data, determining who would have access to such a database and the need to test the library. The training and building expertise discussion focused on the need for communication and trust among stakeholders and examined ideal capacity and capabilities. The discussion also touched upon national integration, the utility of a national response plan, and acknowledging different training needs for different audiences. The discussion noted having access to a pool of experts to leverage would be an important facet of core nuclear forensics capabilities. Summaries of the breakout group discussions can be seen in the annex documents.

## **Conclusions and Steps Forward**

27. Participants affirmed the value of the workshop, the need for greater capacity building efforts and expressed preferences for the subjects and format of future training. Participants noted the disparate capabilities and needs among ARF members and that states possessing core and advanced nuclear forensic capabilities and/or are familiar with more complex aspects of the nuclear fuel cycle could serve as experts and speakers in future capacity building activities. The co-chairs acknowledged the guidance provided by participants regarding training, that suggestions would immediately impact the ongoing EU CBRN CoE initiative programme and emphasized open communication for future feedback. Participants expressed a preference for crime-scene management training and related technical workshops as immediate next steps.