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Opportunity and Challenge of Nuclear Forensics in Indonesia

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Indonesia concerned with the physical protection of nuclear material and nuclear installations, nuclear material accountancy, detection and response to illicit nuclear trafficking, the security and safety of radioactive sources, emergency response measures, including pre-emergency, and the promotion of adherence to relevant international instruments.

It is important for Indonesia to prevent, detect and response to incidents involving the illicit trafficking of nuclear materials and other radioactive sources. Indonesia itself is the victim of several terrorist bombings, and certainly it is unthinkable if the terrorist have had the access to such dangerous materials, such as nuclear material. Currently, Indonesia operates 9 international airports and 20 international seaports. It is necessary for us to ensure that we can effectively reduce the risk of the smuggling of nuclear materials and radioactive sources in these international gateways.

More importantly, Indonesia is a part of the global community in combating nuclear terrorism. As our president mentioned during the Second Nuclear Security Summit in Seoul early 2012, Indonesia fully supports international cooperation to enhance peace and security in the world.

Indonesia, in this case BAPETEN other relevant institutions have the responsibility for combating illicit trafficking and the inadvertent movements of radioactive material. Nuclear forensics is one element of nuclear security regime that should be viewed as the opportunity and challenge for BAPETEN and/or Indonesia.

Objectives: to overview the opportunity and challenge of nuclear forensics in Indonesia

Results:

Nuclear forensics is the analysis of intercepted illicit nuclear or radioactive material and any associated material to provide evidence for nuclear attribution. The goal of nuclear analysis is to identify forensic indicators in interdicted nuclear and radiological samples or the surrounding environment, e.g. the container or transport vehicle. These indicators arise from known relationships between material characteristics and process history [1]. Thus, nuclear forensic analysis includes the characterization of the material and correlation with its production history.

Opportunity of Nuclear Forensics are discipline between science, law enforcement; uses systematic approach for analysis and attribution; benefits from reference data; provides clues on the origin of the material; assures sustainability in combating illicit trafficking; calls for International cooperation; and methodology applicable in other areas.

There is an important difference between nuclear forensics as it is practiced today and the analysis of foreign nuclear test as it was practiced during cold war and for some time thereafter, even though both rest on the same scientific base. Nuclear forensics for attribution involves comparing data and analysis samples from identified sources. Forensics analysis for attribution therefore requires that data concerning foreign origin material be available. Therefore, nuclear forensics analysis would benefit from as much international cooperation as possible.

The challenge of nuclear forensics are:

- (1) the methods safeguards inspectors use to verify compliance with treaty obligations is "environmental sampling", i.e. the collection of particles within (or outside) nuclear facilities using swipe sampling.
- (2) The need for laboratory analysis facilities and new technology; including field equipment and numerical modelling, software of code.

- (3) The need for quality of human resources with relevant capabilities and competencies.
- (4) Nuclear forensics remains a technically complex challenge for the scientific and law enforcement communities. The difficulty in successful forensics work, especially an attribution process, should not be underestimated.
- (5) Knowledge management: the future problem of declining pool of technically competent scientists. The underlying scientific disciplines, radiochemistry, nuclear physics, and others are understood adequately for the purpose of forensics.
- (6) Indonesia has National Legislation Implementation Kit for Nuclear Security to deal with the threat of nuclear and other radioactive material out of regulatory control, namely illicit trafficking, orphan sources and major public event.
- (7) Experience on inspection and law enforcement [2] are the ways of controlling and enforcing nuclear security implementation in Indonesia as parts of nuclear security infrastructure has to be managed at the best and maintained their qualities.

Conclusions: Nuclear forensics to be one of nuclear security infrastructure that has to be planned and strengthened in order to respond to nuclear security events in Indonesia.

References

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- [2]. Beta, WPD. Legal and Regulatory Framework for Safety and Security of Radioactive Sources: Challenge on Inspection of Safety and Security of Radioactive Sources: Indonesia Experience. Books of Synopsis on International Conference on the Safety and Security of Radioactive Sources: Maintaining the Continuous Global Control of Sources throughout their Life Cycle. Abu Dhabi, United Arab Emirates 27–31 October 2013. Organized by the International Atomic Energy Agency (IAEA), hosted by the Government of the United Arab Emirates through the Federal Authority for Nuclear Regulation (FANR).

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