

## **Increasing Role of Nuclear Forensic to Support Nuclear Security Events Investigation in Indonesia**

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This paper will identify the existing nuclear forensic capability and its role in the investigation of nuclear security events in Indonesia. It will also compare the capability to IAEA recommendations and analyze the gaps to identify opportunities for improvement.

The scope is currently national capabilities, traditional and nuclear forensics, and also recommendations for their improvement.

The assessment of national capabilities in nuclear forensics is needed due to Indonesia being an archipelago country, sharing both land borders and maritime borders with its neighbours. Internationally, this made Indonesia to be one of the world trade lines, and nationally much of its trade is done by the sea line. We have a lot of access through sea ports, but not all sea ports have a real portal monitor. This could make possible the movement of illicit trafficked sources from one island to another, or could lead to Indonesia to be a transit point or even result in Indonesia to be a target country for international illicit trafficking. Development of nuclear forensics is also needed to enable international cooperation through the nuclear forensics community, either through the Global Initiative to Combat Nuclear Terrorism (GICNT), the Nuclear Forensics International Technical Working Group (ITWG) or through facilitation by the International Atomic Energy Agency (IAEA).

The method for assessment to identify national capabilities was based on: existing plans and procedures, ISE (Integrated Safety Evaluation) reports 2013 to the IAEA, and also from the evaluation of national field exercises these were then compared to international requirements and recommendations.

In order to achieve sustainable nuclear safety and nuclear security, which is covered by the emergency preparedness aspect, Indonesia has made a national commitment to adhere to international treaties and conventions. Since 2006 we established a national response organization related to nuclear events namely the National Nuclear Emergency Response Organization (OTDNN). The stakeholders are from nuclear emergency preparedness and response, and also nuclear security. At the end of 2007, this organization established their joint procedure, which

developed from stakeholder's procedures, but gave attention to the radiation protection as well as radioactive safety and nuclear security. We also have had regular exercises and drills based on this joint procedure in order to evaluate the existing capabilities and get feedback for its improvement. Based on our field exercises and drills, we still have weakness for the awareness of radiation protection aspect among the first responder. For example, we need to make an arrangement for how to respond effectively without destroying any traditional or nuclear forensic evidence.

Nuclear security has now become a world issue and nuclear forensics is one component in an on-going national programme for nuclear security. In order to support our commitment, we are now in the beginning steps to establish the Indonesia Center of Excellence On Nuclear Security and Emergency Preparedness (ICoNSEP). The primary role of ICoNSEP is to facilitate the development of human resources and the provision of support services on several levels to ensure the long-term sustainability and effectiveness of nuclear security and nuclear emergency preparedness in Indonesia. For nuclear forensics development it also includes the effort to combine the expertise of traditional forensic and nuclear forensic capabilities. Based on the IAEA Nuclear Security Series No. 2, there are several aspects identified for improvement, they are:

1. Capability in incident response. The Police will coordinate with the National Nuclear Regulatory Authority (BAPETEN), and the National Nuclear Energy Agency (BATAN) as the radiological expert. Our weaknesses are in the arrangement for the evidence holding site, since we do not have this arrangement yet and also the arrangement to transport the radioactive evidence. We also need to improve our capability in evidence collection, since collection of traditional forensic evidence might interfere with the collection of radioactive evidence.
2. Capability in nuclear forensics laboratory. So far only BATAN which has competent staff in handling radioactive contaminated evidence and also for current standards, but their instruments need to be reassessed according to the latest technology. BAPETEN is in an on-going process to establish their laboratory. We also need to establish our national nuclear forensics library so we can determine ownership of the material as soon as possible.
3. Capability in nuclear forensic analysis and traditional forensic analysis. We need to improve our attribution capability since we very rarely have to deal with this kind of investigation.
4. Capability in nuclear forensic interpretation. Experts who have both expertise in radioactive material and traditional forensic analysis is a limitation. Therefore we need to develop our human resources to meet this requirement.

Based on these findings we need to make an action plan, the recommendations are:

- Year 1 to 2: development for the incident response capabilities;
- Year 2 to 5: development for a national nuclear forensic library, resource development for competent staff and laboratory; and

- Year 5 to 10: human resource development for nuclear forensic analysis and interpretation.

Since the responsibility for nuclear security rests entirely with individual States, we need to develop our nuclear security system together with the nuclear forensic capabilities.