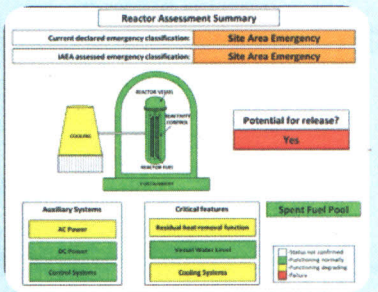
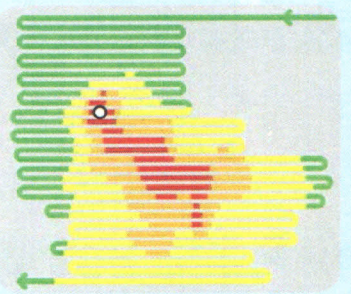
International Experts Meeting on

Assessment and Prognosis in Response to a Nuclear or Radiological Emergency

in connection with the implementation of the IAEA Action Plan on Nuclear Safety





BOOK OF EXTENDED SYNOPSES

IAEA Headquarters
20–24 April 2015
Vienna, Austria

IAEA
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Contents

Indonesia, Eri Hiswara

Indonesia Approaches to Nuclear Emergency Preparedness and Responses

E. Hiswara

National Nuclear Energy Agency (BATAN), Indonesia

Email of corresponding author: e.hiswara@batan.go.id

INTRODUCTION

Nuclear and/or radiological accidents and situations resulting from malicious acts involving radioactive material can become a serious threat to people's life and health, as well as to its environment. The authorities of the states concerned have, therefore, the responsibility to arrange preparedness and implement appropriate response actions to ensure that relevant resources are available for mitigation. This demands efficient cooperation, communication and information between all stakeholders taking part in response actions.

Indonesia is a country that has utilized nuclear and./or radiation for various purposes, and benefited from it. In medical sector radiation has been applied for diagnostic radiology, radiotherapy and nuclear medicine. In fact, most of licences issued by the Indonesian Nuclear Energy Regulatory Agency (BAPETEN) are for these applications. Other utilizations include applications in industry, food, agriculture and research.

Recognizing the potential hazard of radiation, Indonesia has from 1960s developed nuclear and/or radiation safety and security system, including emergency preparedness and responses. The first Act regarding nuclear energy issued in 1964 had a provision that required the government to issue regulations to prevent accident due to the utilization of atomic energy. The current Act on nuclear energy that in force since 1997 also requires that any activity related to the utilization of nuclear energy shall maintain the safety, security, peace, health of workers and the public, and the environmental protection.

This paper will briefly discuss the Indonesian approaches to nuclear emergency preparedness and response. It will explore the status of the related law and regulations, organization, preparedness required and procedures for conducting the responses.

LAW AND REGULATIONS

The highest regulation in utilization nuclear energy in Indonesia is Act Number 10 Year 1997 on nuclear energy. As stated above, this Act has a provision in Article 16 regarding the safety, security, peace, health of workers and the public, and the environmental protection in utilizing nuclear energy in Indonesia. This article forms the basis for arranging the nuclear emergency preparedness and responses in Indonesia. Another related regulation is Act Number 24 Year 2007 on Disaster Countermeasures. This Act provides a platform for conducting mitigation actions against natural as well as manmade disaster.

For international cooperation, Indonesia has ratified the IAEA's Early Notification and Assistance Conventions in 1993. The Early Notification is ratified by Presidential Regulation Number 8l Year 1993, and the Assistance Convention is ratified by Presidential Regulation, Number 82 Year 1993. In addition, Indonesia has also ratified the Convention on Nuclear Safety by Presidential Regulation Number 106 Year 2001.

In Government Regulation Number 4 Year 2012 (GR 4/2012) on the Safety and Security of Nuclear Installation, Chapter 5 is dedicated to provision on nuclear emergency preparedness and responses. The last but more implementing one is Chairman of BAPETEN Regulation Number I Year 2010 on nuclear emergency preparedness and responses.

ORGANIZATION

According to GR 412012, nuclear emergency preparedness consists of preparedness in national level, provincial level, and installation level. A nuclear accident will be declared as nuclear emergency at national level by the President, after receiving recommendation from BAPETEN, if dose rate at the boundary of a particular nuclear installation is 500 μSv/h or more, measured for l0 min or more, and/or abnormal release of radioactive material with airborne activity concentration equivalent or more than dose, rate of 500 μSv/h at installation boundary, detected from normal release pathway. Chairman of National Agency for Disaster Countermeasures BNPB) will initiate and lead the response actions.

An organization called National Emergency Response Organization (OTDNN) is being discussed for this nuclear emergency response action in national level. Chairman of BATAN will be acting as deputy chairman of OTDNN, while BAPETEN will supervise all actions conducted. The backbone of OTDNN will be first responders and radiological assessment team, with some ministries provide technical supports for operational. The final draft of structure of the organization is given in Figure 1.

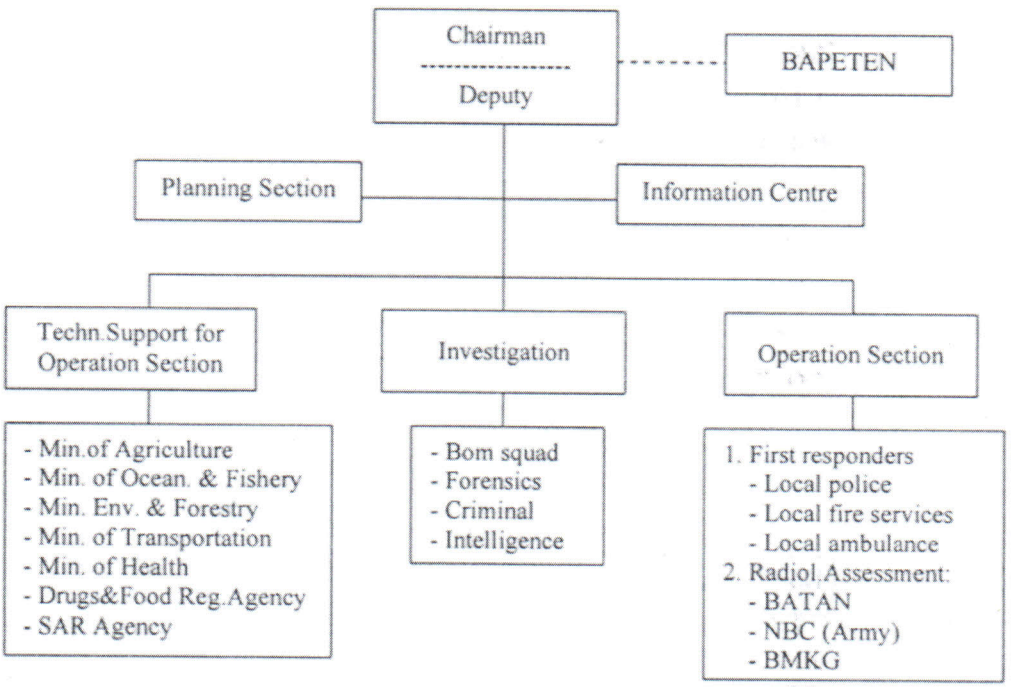

Figure l. Structure of Indonesian Nuclear Emergency Response Organization (final draft).

Nuclear emergency at provincial level will be declared by governor of a province if dose rate at the boundary of a particular nuclear installation is 5 μSv/h or more, measured for l0 min or more, and/or abnormal release of radioactive material with airborne activity concentration equivalent or more than dose rate of 5 μSv/h at installation boundary, detected from normal release pathway. In installation level, the licensee or operator will declared the status of nuclear emergency if a condition that exceeding basic design value is occurred.

PREPAREDNESS

Coordination is a central issue in implementing nuclear emergency preparedness and responses. The licensee shall coordinate with some related institutions in this case, among others local government, local agency for disaster countermeasures, local police, local fire services and local hospital. The

coordination is particularly necessary when preparing nuclear emergency program and performing exercise and drill of the program.

Facility and equipment are also important during preparedness for nuclear emergency. They shall always be in operational condition and use as instructed by procedures. While the availability of equipment depends upon the threat category of emergency, an installation shall at least acquires some equipment as early detection and alarm, radiation monitoring, decontamination, medical emergency, fire services, protection for emergency and other workers, and radioactive waste handling. Threat category in this case consists of category I (applied to facilities potential for very big hazard to cause deterministic effect off-site), category II (facilities potential to exceeding dose limit), category III (facilities potential to cause deterministic effect on-site), category IV (activities that could give rise to emergency in an unforeseeable location), and category V (activities not involving radiation sources but results in products with a significant likelihood of becoming contaminated as a result of events at facilities in threat categories I or II).

In case of facility, the minimum to be provided by the licensee are communication system, evacuation path and assembly point. For nuclear reactor and other installations in threat category I and II, the licensee shall also provide facilities for conducting response actions on and off-site, coordination for public information, and coordination for monitoring and assessment off-site.

RESPONSES

Nuclear emergency response is performed with the objectives to control the situation, prevent and mitigate consequences in the scenes or sources, provide first aid to the victim and manage the condition thereafter, prevent deterministic effect and reduce the probability of stochastic effect to workers and public, prevent non-radiological effects to individual and population, and protect property and environment. It is the responsibility of licensee, therefore, to perform emergency response as early as possible.

During response actions for facilities and installations categorized as I, II and III, the status of emergency should be clearly identified as alert, site emergency or general emergency. While alert is a condition where the threat affects only to installation's building, site emergency affects to on-site are4 and general emergency affects off-site area.

The licensee shall also report the emergency situation without delay to BAPETEN, and activate emergency workers in the facility. Other licensee tasks include performing mitigation to prevent the escalation of radiological hazards and bring the facilities back to safe and stable condition, providing urgent protective measures in the form of evacuation, temporary shelter and distribution of iodine tablet, and establish pr6tective measures to emergency workers, other workers and the public. Protective measures in this case include clear information on the risks of radiation exposures to first responders, ensures that radiation doses received by emergency workers do not exceed the dose guidance value set exclusively to them. For the public, the licensee is responsible to provide medical treatment to those contaminated or overexposed by radiation.

The most important responsibility of the licensee to the public, however, is providing correct and in time information and guidance regarding nuclear emergency. The licensee shall be ready to response to incorrect information and rumour, as well as to response to request for information from the public and media.

EXERCISES AND DRILLS

Exercises and drills are actually part of preparedness. In Indonesia, several exercises and drills that have been conducted, involving both radiation workers and the public, are as follows:

a. National field exercise, scenario: radiological emergency response was conducted as a result of transportation accident; conducted in Yogyakart October 2008.
b. National table top exercise, scenario: severe accident, on 2 MW research reactor; conducted in Bandung, October 2009.
c. National field exercise, scenario: severe accident on 30 MW research reactor; conducted in Serpong, October 2010.
d. National field exercise, scenario: radioactive sources transportation accident at a seaport; conducted in Surabaya, November 2011.
e. National field exercise, scenario: radioactive sources transportation accident in a roadway; conducted in Bandung, September 2013.

In BATAN, emergency drills are also conducted every year. Every facility should perform this drill to enhance and improve the capability of their emergency workers. The accident scenes are moving from one laboratory to another, to give experiences to those workers in performing responses in different emergency situation. In cooperation with Fatmawati General Hospital, BATAN also every year conducting training on medical responses to a nuclear emergency. This training has been attended by member of fire services, ambulances, and medical doctors from various government and private institutions. In this connection, there is a plan to appoint three hospitals as reference hospital for nuclear emergency, i.e. Fatmawati hospital in Jakart Hasan Sadikin hospital in Bandung, and Sardjito hospital in Yogyakarta.

CONCLUDING REMARKS

In line with the increase of nuclear application in various sectors, Indonesia has been continuously work to improve the capacity and capability in nuclear emergency preparedness and responses. Some elements, such as assessment of initial phase of emergency, method of agricultural countermeasures, and public information, however, are still need to be developed and improved.

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