



**BADAN PENGAWAS TENAGA NUKLIR**  
Indonesian Nuclear Energy Regulatory Agency



# **Developing Regional Network in Anticipating the Transboundary Nature of Nuclear Accidents in South-East Asia “Indonesia Perspective”**

**Suharyanta**  
**Indonesia**

**ASEM Seminar on Nuclear Safety III**  
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# Outline presentation:

**Overview of Regional Approaches to Civilian Nuclear Activity Management in South-East Asia**

**Introduction : Nuclear Regulatory framework and Nuclear Installations in Indonesia.**

**EPR and Radiological Data Monitoring System**

**EPR Exercises**

**Developing Center of Excellent (I-CoNSEP) and Challenges for Regional Cooperation**

# **Overview of Regional Approaches to Civilian Nuclear Activity Management in South-East Asia**

**Primarily based on the Association of South-East Asian Nations (ASEAN),  
with 10 Member States, viz., Brunei Darussalam, Cambodia, Indonesia,  
Lao People's Democratic Republic (PDR), Malaysia, Myanmar, the Philippines, Singapore, Thailand & Viet Nam.  
(later after one country Timor Leste became member of ASEAN)  
Three pertinent areas for civilian nuclear activity management under ASEAN:**

## **1). Political & Security:**

- Key instrument is Treaty on South-East Asia Nuclear Weapons-Free Zone (SEANWFZ) or Bangkok Treaty in 1995, coordinated by SEANWFZ Commission established by the Treaty. [Indonesia ratified the treaty in 1997.](#)**
- Political & Security sector coordinated by ASEAN Standing Committee (ASC).**
- All 10 ASEAN Member States are States Party to the SEANWFZ Treaty.**
- ASEAN Network of Regulatory Bodies on Atomic Energy (ASEANTOM) to reinforce the work of the SEANWFZ Commission.**

# Overview of Regional Approaches to Civilian Nuclear Activity Management in South-East Asia

## **2). Energy:**

- **Focus on the Nuclear Energy Safety Sub-Sector Network (NES-SSN) under the Senior Officials Meetings on Energy (SOME) of the ASEAN Ministers of Energy Meetings (AMEM).**
- **Regional cooperation in the nuclear field under AMEM-SOME also supported by the Republic of Korea and other countries as ASEAN Dialogue Partners.**

## **3). Science & Technology:**

- **Focus on nuclear energy technology through the Technical Working Group on Nuclear Power Plants (TWG-NPP) under ASEAN Committee on Science & Technology (ASEAN COST) of the ASEAN Ministerial Meetings on Science and Technology (AMMST).**
- **Conversion - Reduced enrichment from HEU to LEU. Indonesia succeeded to reduce all Fuel element and or Isotope production target from HEU into LEU.**

## Safeguards Regime in South-East Asia

**Safeguards verification under SEANWFZ Treaty entrusted to the IAEA, as provided for by the Treaty.**

**No regional safeguards verification agency for the SEANWFZ Treaty envisaged or deemed necessary to avoid duplication with the international safeguards, especially since all of the 10 States Party to the SEANWFZ Treaty are also both States Party to the Treaty on the Non-proliferation of Nuclear Weapons (NPT), for which the IAEA is also the designated safeguards verification agency, as well as Member States of the IAEA.**

**Brunei Darussalam became a Member State of the IAEA in 2014.**

# **Comprehensive Safeguards Agreements & Additional Protocols** **in South-East Asia**

**All 10 ASEAN Member States have Comprehensive Safeguards Agreements with the IAEA for the Application of Safeguards in Connection with the NPT, which are in force.**

**Of the 10 ASEAN Member States, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand & Viet Nam have signed Additional Protocols to Comprehensive Safeguards Agreements, but with Malaysia, Myanmar and Thailand have yet to ratify.**

**Indonesia has recognized “integrated safeguards” in 2003, as the 3<sup>rd</sup> country in the world with wider well implemented of both comprehensive safeguards agreement (CSA) and additional protocol to that agreement.**

**While other countries, such as Malaysia in the process of enacting a new comprehensive nuclear law, including relevant provisions for implementation of the Additional Protocol, and, thus, facilitate its ratification.**

## **Multilateral Cooperation in Nuclear Activities in South-East Asia**

**Mainly through the IAEA:**

- **IAEA Technical Assistance and Cooperation Programme (TACP);**
- **IAEA Extra-Budgetary Programme (EBP);**
- **Regional Cooperative Agreement for Research, Development and Training relating to Nuclear Science and Technology in Asia and the Pacific (RCA), with 21 member States, including Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam, from among the ASEAN Member States, except Brunei Darussalam and Lao PDR, with other member States outside the region, viz. Australia, Bangladesh, China, Fiji, India, Japan, the Republic of Korea, Mongolia, Nepal, New Zealand, Pakistan, Palau & Sri Lanka.**
- **Asian Nuclear Safety Network (ANSN); and,**
- **Asian Network for Nuclear Education and Training (ANENT).**

## **Multilateral Cooperation in Nuclear Activities in South-East Asia**

**Supported by other cooperative framework outside the IAEA:**

- Forum on Nuclear Cooperation in Asia (FNCA) initiated & led by Japan, outside the framework of the IAEA, with Indonesia, Malaysia, Philippine, Thailand & Viet Nam as members among the 10 ASEAN Member States, and other members outside the region, viz. Australia, Bangladesh, China, Kazakhstan, Mongolia, the Republic of Korea & Japan.**
- Cooperation EU-ASEAN on EPR has been started 2014-2015 with Feasibility study of EPR in ASEAN. Only 6 participating countries Indonesia, Malaysia, Thailand, Philippine, Vietnam and Singapore. There is no representatives from other ASEAN countries, therefore It needs more effort on political level decision.**



# **NUCLEAR REGULATORY FRAMEWORK**

## **IN INDONESIA**

### **~~RULE AND REGULATION RELATED TO EPR :~~**

- Act No.10 /1997 on Nuclear Energy.**
- GR No. 54 /2012 on Safety and Security of Nuclear Installation**
- GR No. 2 /2014 on Licensing of Nuclear Installations and Materials**
- BCR No. 1 /2010 on Nuclear Emergency Preparedness and Response**

International (IAEA) cooperation based on Convention of

National Competent Authority-Abroad (NCA-A)	Deputy Chairman of BAPETEN
National Competent Authority-Domestic (NCA-D)	Director of Tech Support and Emergency Preparedness - BAPETEN
National Warning Point (NWP)	Head of Sub-directorate of Emergency Preparedness - BAPETEN

# **NUCLEAR REGULATORY FRAMEWORK IN INDONESIA**

- Act No.10 /1997 on Nuclear Energy, BAPETEN is an independent Regulatory Body, which is authorized to control any nuclear energy utilization through regulation, licensing and inspection.”
- BAPETEN perform its functions through the implementation of licensing and inspection to the construction and operation of nuclear reactors, nuclear installation, nuclear material facilities, radiation source, **and the development of nuclear emergency preparedness and response (EPR).**
- Function of EPR consist of Regulation, Organization, Infrastructure, Man power and coordination, and Exercises.

# Government Regulations No. 54/2012 on Safety and Security of Nuclear Installation (1)

- Article 74-77: nuclear emergency criteria when initiation of emergency response level will be declared :
  - on facility level: an event exceeded the design based values
  - on local government level:
    - an event with the dose rate of 5  $\mu\text{Sv/hr}$  or higher is measured at the site boundary for continuously within 10 minutes or longer;
    - an abnormal radioactive release with the airborne activity concentration equivalent to the dose rate of 5  $\mu\text{Sv/hr}$  is detected at the site boundary.
  - on national level:
    - an event where the dose rate of 500  $\mu\text{Sv/hr}$  or higher is measured at the site boundary for continuously within 10 minutes or longer;
    - an abnormal radioactive release where the airborne activity concentration equivalent to the dose rate of 500  $\mu\text{Sv/hr}$  is detected at the site boundary

# Government Regulations No. 54/2012 on Safety and Security of Nuclear Installation

## (2)



- Article 66: Nuclear emergency preparedness is conducted based on nuclear emergency preparedness programme
- Article 69, 71, 73: required for exercises or drills on nuclear emergency:
  - on facility level, at least once every year
  - on local government level, at least once every 2 years - in coordination with the operator
  - on national level, at least once every 4 years - in coordination with BAPETEN and relating agencies, involving the local government, and the operator as well.

# Nuclear and Radiation Facilities in Indonesia

## A. INSTALATIONS AND NUCLEAR MATERIAL

### 1. RESEARCH REACTORS ( BATAN )

- a. Multipurpose Reactor - GA Siwabessy ( 30 MW) in Tangerang.
- b. TRIGA Mark Reactor ( 2 MW ) in Bandung
- c. TRIGA Mark Reactor ( 100 KW ) in Jogjakarta

### 2. OTHER NUCLEAR FUEL CYCLE FACILITIES ( BATAN ).

### 3. NPP ??

→ Research reactors are mainly for Radioisotope Production, R&D activities, and Training and Education.

## B. RADIATION FACILITIES AND RADIOACTIVE MATERIAL

### 1. Hospital-Health sector ~ 7000 licenses;

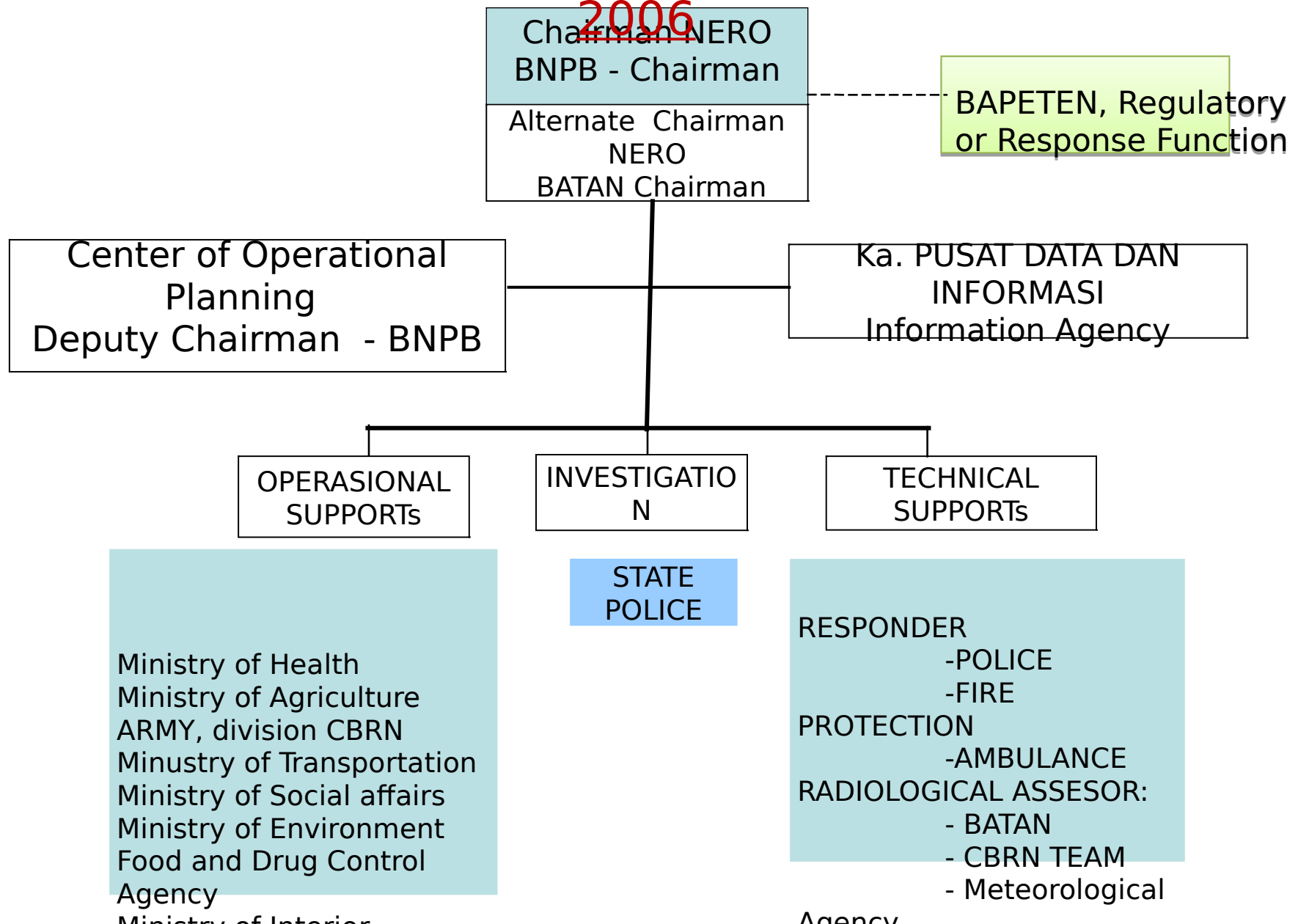
→ These facilities are mainly for diagnostic and treatment activities

### 2. Industrial sector ~ 3000 licenses;

→ These facilities are mainly for gauging, logging and radiography

# Structural NERO (OTDNN) (National Nuclear Emergency Response Organization),

2006



## **Chairman Regulation No. 14 /2007 on BAPETEN - Emergency First Responder Team (under revision)**

### **BAPETEN established First responder team :**

- Member 20 well trained persons.
- Functions of First responder team is to coordinate or to take a response action in case of emergency. Possible emergency could come from : Nuclear and radiological accidents, and/or Finding of Orphan Sources, Trans- boundary release from other countries, and RDD (Radiological Dispersal Devices), Nuclear powered marine and submarine, Un-controlled Nuclear powered satellite re-entry.
- First responder is operated 24/7.

# **Coordinations and EPR Field Exercises**

**BAPETEN initiate and facilitate to encourage national coordination among stakeholder related EPR, the most activities on :**

- **Developing contingency plans in local and national emergency plan.**

**Stakeholder related EPR, such as :**  
**Performing exercises in local and national level.**

National Disaster Management Agency (BNPB), Ministry of Health, Ministry of Agriculture, ARMY (division CBRN), State Police (Forensic division and CBR division), Ministry of Transportation, Ministry of Social affairs, Ministry of Environment, Meteorological Agency, Food and Drug Control Agency, Ministry of Interior, Fire protection agency, SAR Agency, Counter

**Exercise :**  
Terrorism Agency, and Other.

- EPR Exercise is conduct regularly in Facility level, Local Government Level (Province), and National Level.
- Special cases of each Exercise Scenario as initiating events, such as malfunction of system and Human error at the facilities, accident during radioactive transportation, and/or Security event (theft and sabotage)

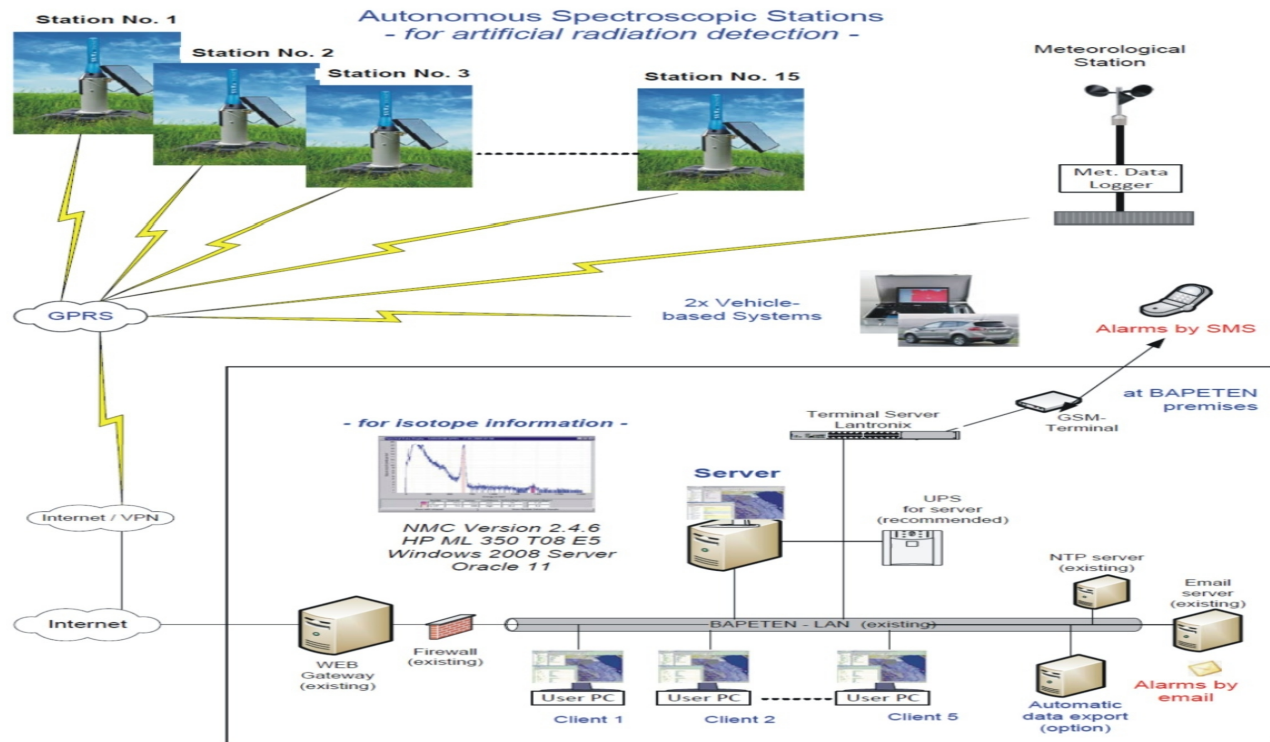


# Radiological Data Monitoring System (RDMS)

- Part of infrastructure of detection tools, those are implemented by installing RDMS at site boundaries of nuclear installations, and in outer boundaries of Indonesian territory.
- RDMS as a part of the national emergency preparedness system
- RDMS has a function as an early warning system in case of radiological release
- RDMS observes and records all data based on Gamma-dose rate and radionuclide identification.
- All stations are connected and monitored at the Crisis Center Monitoring Room in BAPETEN office – Jakarta.

# Radiological Data Monitoring System (RDMS)

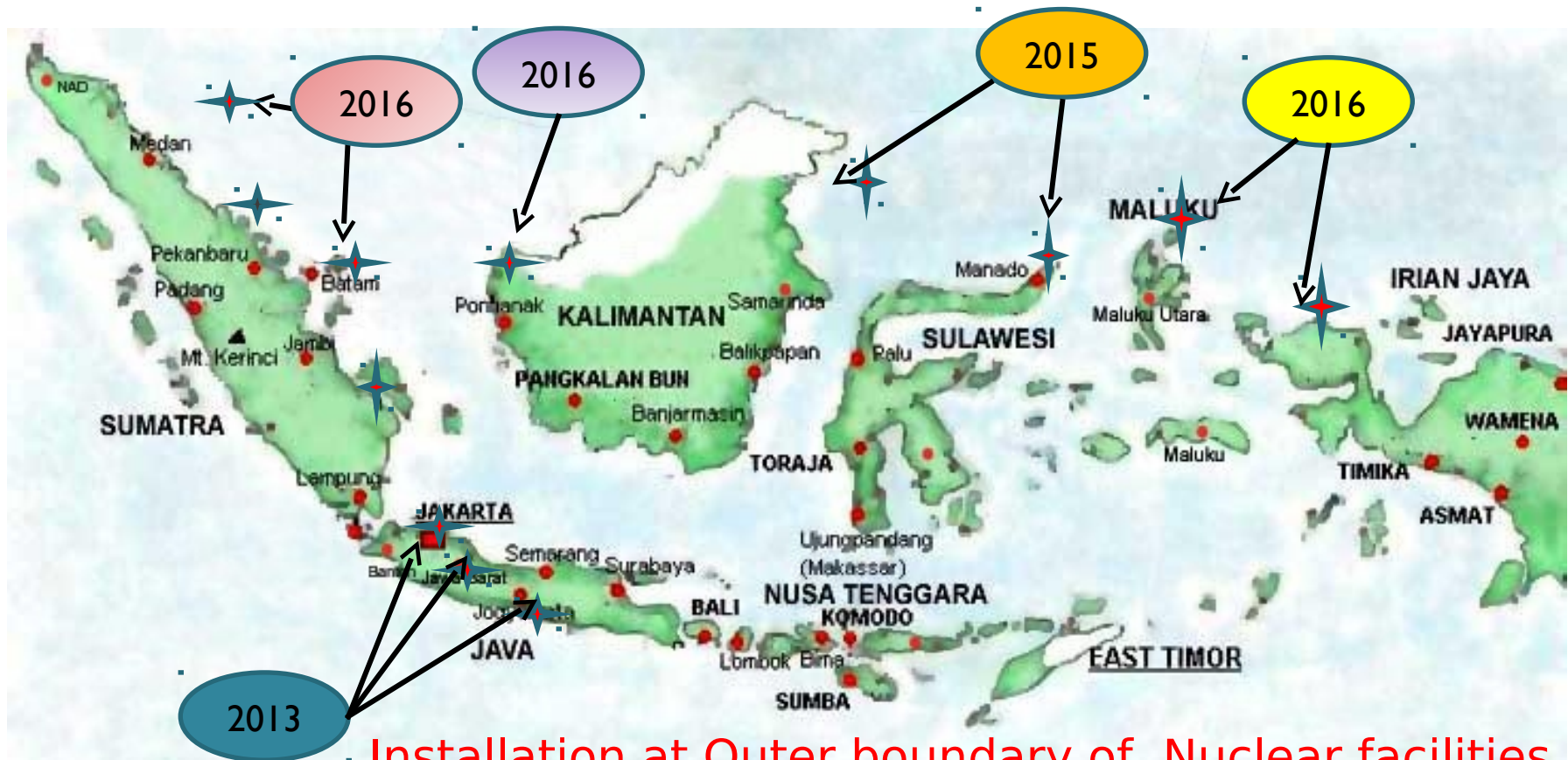
## Environmental Radiation Monitoring and Early Warning System (ERMEWS) for Nuclear Agency of Indonesia (BAPETEN)



Schematic mechanism of centralized On-line RDMS for both stationary and mobile system.



# Proposed plan of RDMS location



Installation at Outer boundary of Nuclear facilities and  
Outer boundary of Indonesia territory

# EPR - Exercises (1)



Sea Transportation  
November 2011



Transportation  
September 2013



Table Top Exercise  
October 2009

**Some pictures of EPR experiences -  
Exercises since 2005**



# EPR - Exercises (2)



RDD, September 2005



Transportation  
October 2008



Nuclear facility Emergency  
October 2010



# Cooperation - Challenges (1)

## I-CoNSEP :

**On August 2014, Indonesia cq. BAPETEN and all stakeholder initiate to promote Indonesian Center of Excellent (CoE) for Nuclear Security and Emergency Preparedness(I-CoNSEP), program objective :**

- supporting and facilitating the capacity development of **sustainable human resources** through the provision of a National Nuclear Security and Emergency Preparedness (EPR).

- Promoting to enhance effective coordination in Nuclear security and **I-CoNSEP on Nuclear Security (NS) program :**

- - Security (Physical Protection) in the Nuclear Facility international.
- Security in Radiation facilities.
- Security of Radioactive Out of regulatory control (out of facilities).

## **Specific Training and Workshop on NS, such as for :**

- Responder team at facilities, and responder from supporting agencies (at the local government).
- Front liner officer (FLO) at the gate import and export to prevent illicit trafficking of Rad.Mat'l.
- Nuclear Security culture.
- National Nuclear Forensic.
- Cyber security in nuclear application, etc.

# Cooperation - Challenges (2)

## **I-CoNSEP on EPR program :**

- Capacity building on EPR personnel at Nuclear Facility, at Radiation facilities, and at out side facilities.
- National - Coordination building of all stakeholder on EPR, and EPR exercise .
- Regional cooperation on Sharing data and information of monitoring system (TTE) on EPR in the ASEAN or Asia Region.
- Encouraging national capacity to contribute to international community through IAEA's Response and Assistance Network (RANET).

## **Specific Training and Workshop on EPR, such as for :**

1. Responder team at facilities, and responder from supporting agencies (at the local government). Training covers : Source Search and Recovery; Radiation Survey; Environmental Sampling and Analysis; Radiological Assessment and Advice; Medical Support; Dose Assessment; Decontamination; and Nuclear Installation Assessment and Advice.
2. Responder team at Local government out site of Facilities.
3. Table Top Exercise on EPR in the ASEAN or Asia region, .

THANK YOU

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Terima kasih

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