

The Indonesian – Radiation Detector Monitoring System (I-RDMS), a Nuclear Early Warning System for Transboundary Radioactive Release Detection

Alifia Rahmawati

Nuclear Energy Regulatory Agency of Indonesia
(Badan Pengawas Tenaga Nuklir – BAPETEN)



INTRODUCTION

Radioactive release resulted from an NPP accident or nuclear weapon test might spread across the national border to the territory of the Republic of Indonesia. Therefore, BAPETEN initiated a system that works in real time and online to detect radioactive releases that entering Indonesia. This system is called I-RDMS.

METHODS/DATA

In 2018, BAPETEN started the I-RDMS project by installing 5 (five) gamma detectors in the CTBT stations (Kappang, Lembang, Bautama, Jayapura and Sorong), in collaboration with the Meteorological, Climatological, and Geophysical Agency (BMKG).

START

RESULTS

1. Operational of I-RDMS consists of daily monitoring, alarm function and annual technical visit.
2. Environmental gamma dose rate information under normal conditions was obtained for Indonesia CTBT station areas.

CONCLUSION

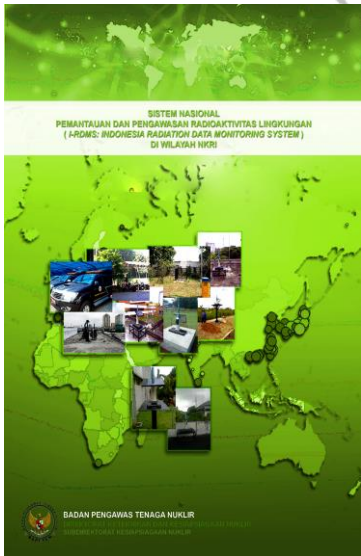
The I-RDMS at the CTBT station continues to provide environmental radioactivity monitoring data with varying values for each region. Currently, BAPETEN is working with the BMKG to gradually increase the number of detectors to increase the surveillance area in Indonesia.

Introduction

**TRANSBOUNDARY
RELEASE CHALLENGE**

**A NATIONAL STRATEGY THAT CAN
BE IMPLEMENTED**

**Indonesia – Radiation
Data Monitoring System
(I-RDMS)**



**MUST BUILD A RELIABLE NUCLEAR EARLY
WARNING SYSTEM, BECAUSE:**

1

Radioactive release from an NPP accident (e.g., Fukushima 2011) or military activity might spread across the national border to Republic of Indonesia's territory → **transboundary release threat**

2

Potential threat might spread across 13,466 islands throughout Indonesia with a coastline of 54,716 km → **where and when the transboundary release will arrive to Indonesia?**

Indonesia commitment by ratifying related international convention:

3

- **Nuclear Non-Proliferation Treaty (NPT)**, ratified with **Act No 8/1978**
- Convention on **Early Notification of a Nuclear Accident**, ratified with **PR No. 81/1993**
- The **Southeast Asia Nuclear Weapon Free Zone Treaty (SEANWFZ)**, ratified with **PR No. 9/1997**



INTRODUCTION

OBJECTIVES

METHODS/DATA

RESULTS

CONCLUSION

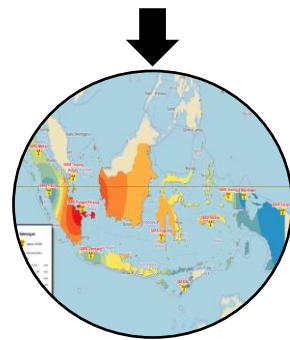


Please do not use this space, a QR code will be automatically overlaid

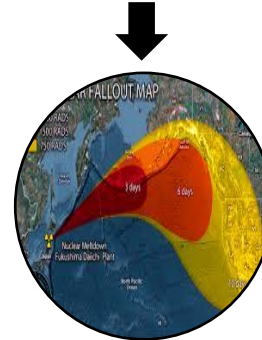
P2.4-200

I-RDMS OBJECTION

1. Environmental radioactive real time monitoring.
2. International data sharing within IRMIS-IEC, IAEA.
3. Obtaining of the radioactive background information as baseline data.



Preparedness Condition
(Normal Situation)



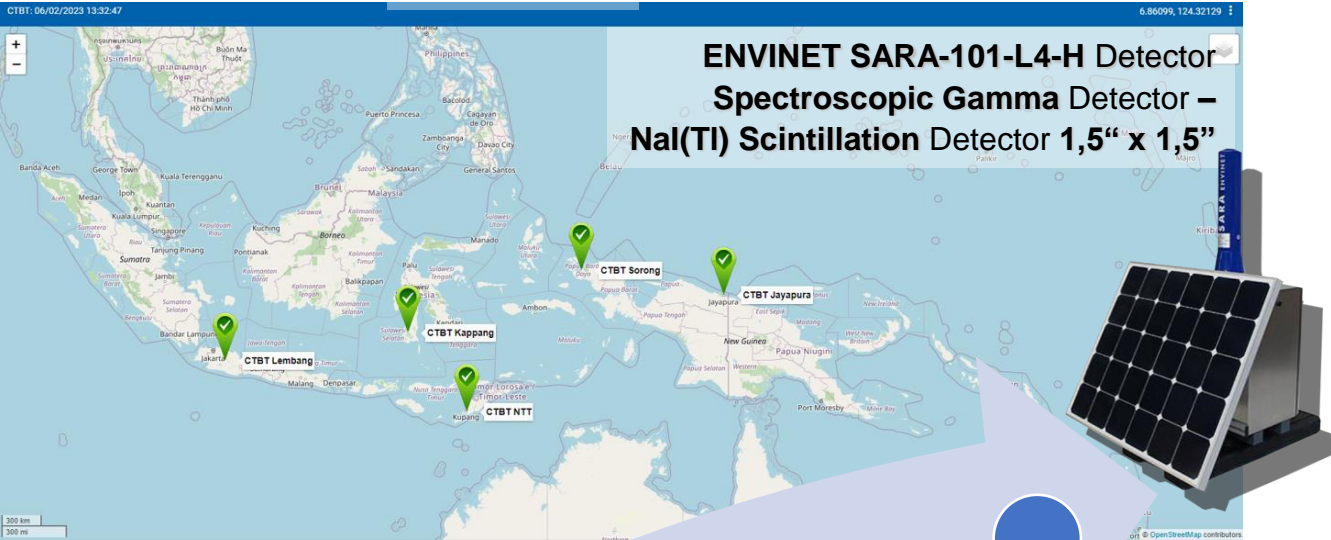
Nuclear/Radiological
Incident Information

1. Nuclear Early Warning System (N-EWS).
2. Decision Support System input data.

I-RDMS Installation in CTBT station

The placement at the Indonesia CTBT station produces **verification of information** regarding any **incident of nuclear weapons** related activity and whether the **effects of radiation** reached Indonesia. It is also purposed to **obtain the baseline data on environmental radioactivity** under normal conditions.

MoU BAPETEN and BMKG



CTBT Lembang



CTBT NTT



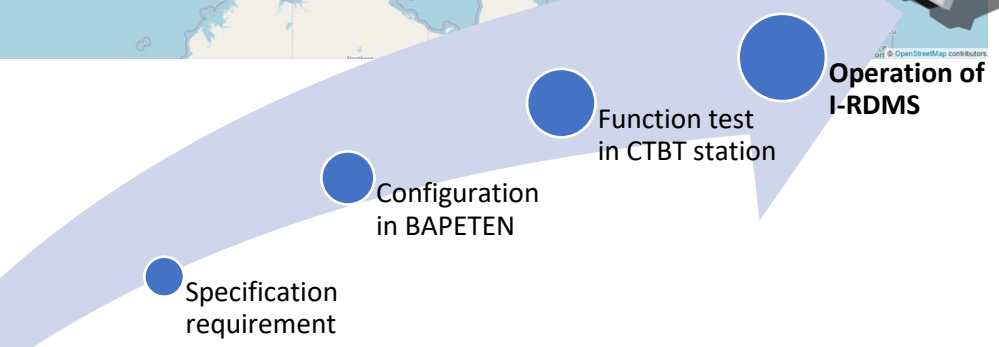
CTBT Jayapura



CTBT Kappang



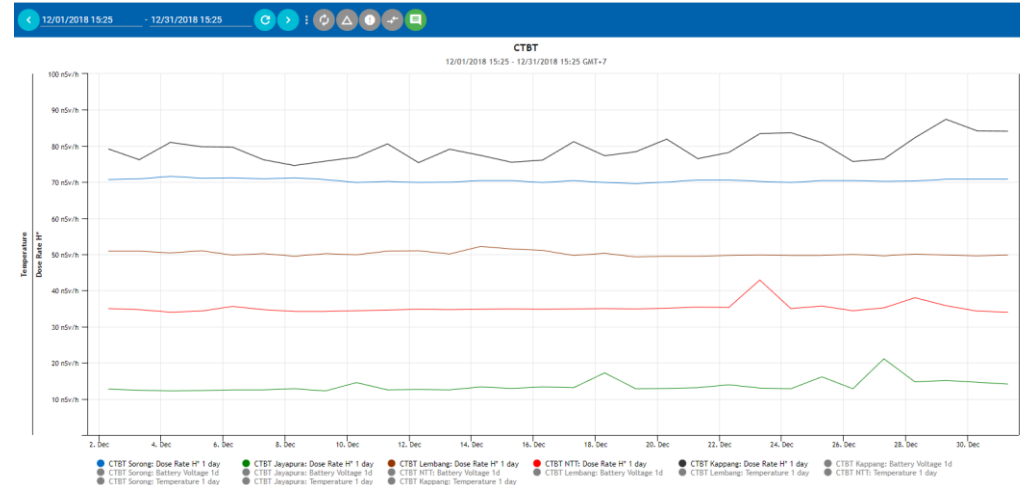
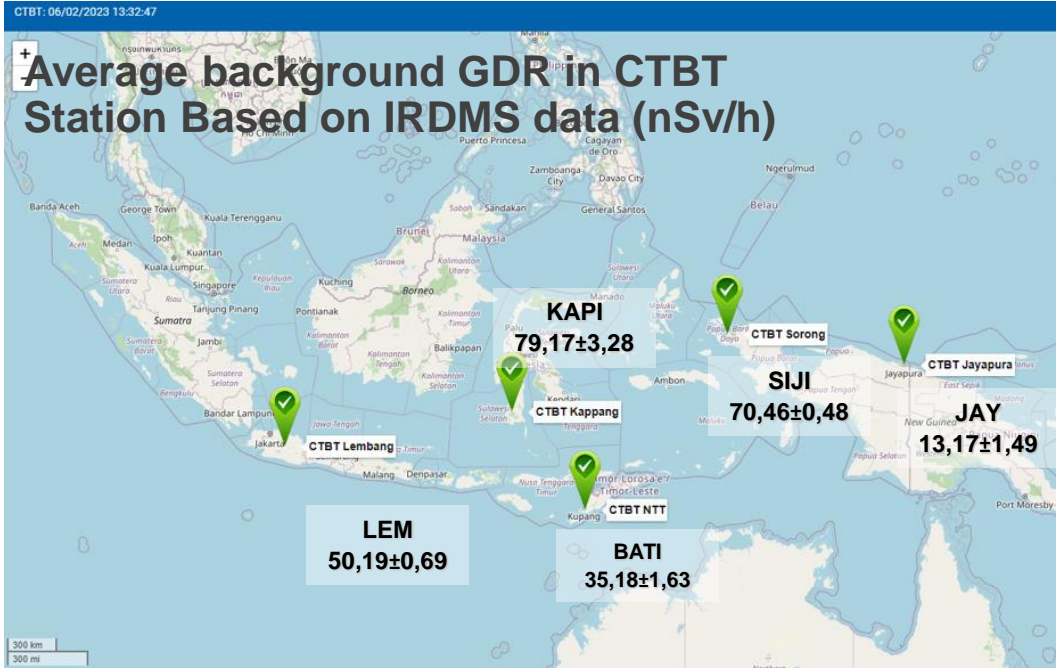
CTBT Sorong



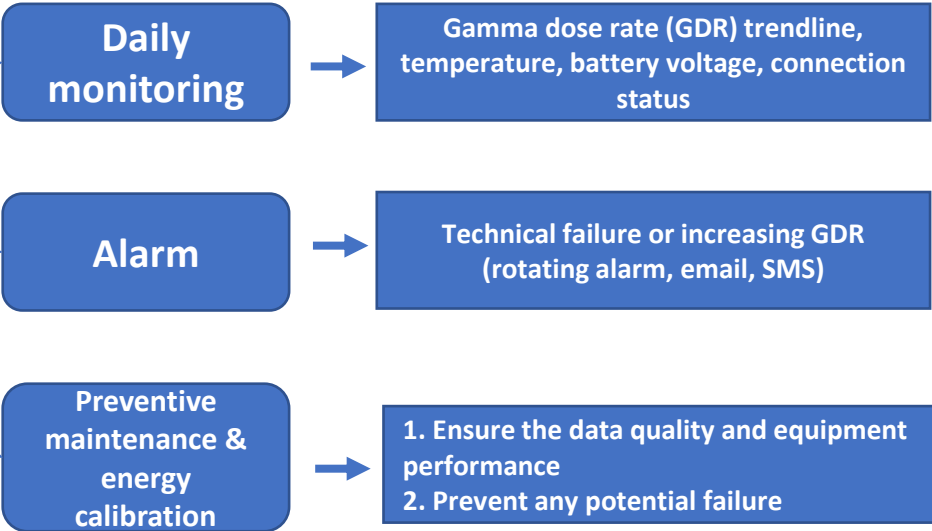
No.	Station Name	Station Code	Latitude	Longitude	St_Group	Status	Elevation (m)
1	Kappang, South Sulawesi (AS044)	KAPI	-5.0142	119.7517	CTBTO (INA)	Used	300
2	Lembang, Bandung, West Java	LEM	-6.8266	107.6175	JISNET (Japan)	Used	1283
3	Bautama, NTT (AS045)	BATI	-10.2065	123.6633	CTBTO (INA)	Used	344.81
4	Jayapura, Papua (AS041)	JAY	-2.51447	140.70433	CTBTO (INA)	Used	458.76
5	Sorong, West Papua (AS042)	SIJI	-0.86912	131.26605	CTBTO (INA)	Used	200.91

- INTRODUCTION
- OBJECTIVES
- METHODS/DATA
- RESULTS
- CONCLUSION

Please do not use this space, a QR code will be automatically overlaid



Operation



- INTRODUCTION
- OBJECTIVES
- METHODS/DATA
- RESULTS**
- CONCLUSION



Please do not use this space, a QR code will be automatically overlaid

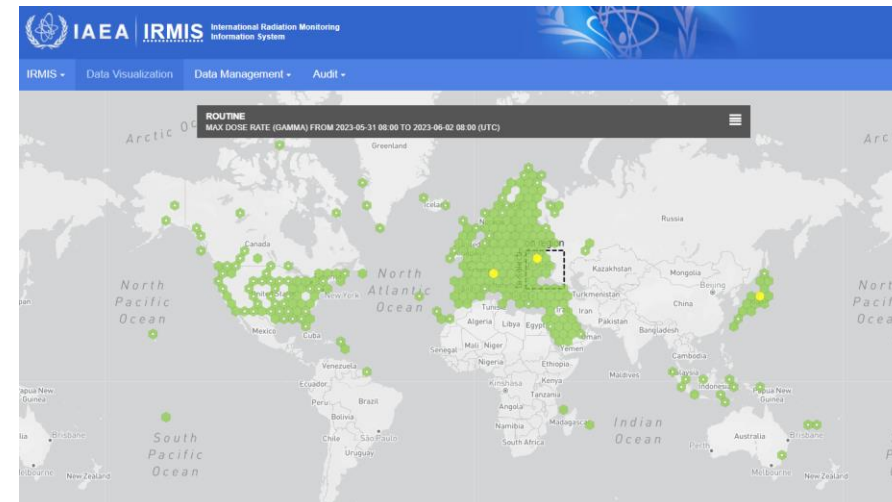


Conclusions

1. The I-RDMS at the CTBT station continues to **provide environmental radioactivity monitoring data** with varying values for each region.
2. BAPETEN is working with the BMKG to gradually increase the number of detectors to **expand the surveillance area** in Indonesia. Beside of 5 CTBT stations in 2018, BAPETEN also had installed 17 stations in BMKG stations since 2019-2022 and continue to achieve the target.

Recommendations

Hopefully there will be an opportunity to **share knowledge** from countries that have similar systems on how to **maintain the equipment, ensure the data quality, analyze the data, share the data** to the related stakeholder, and **respond the radiological alarm/notifications**.



INTRODUCTION

OBJECTIVES

METHODS/DATA

RESULTS

CONCLUSION



Please do not use this space, a QR code will be automatically overlaid



References

1. *Term of Reference: National System of Environmental Radioactivity Monitoring and Surveillance in Indonesia (National Nuclear Regulatory Agency of Indonesia)*
2. *Cooperation agreement between DKKN BAPETEN and BHO BMKG regarding Implementation of Monitoring of Environmental Radioactivity in Meteorological, Climatological and Geophysics Aspects 2018*

Acknowledgement

I would like to express my gratitude to Mr. Toto Heryanto and Mr. Ferdinand as the former supervisor and PIC of the IRDMS program, so the program can be initiated and progressed suitably. I also thank Mr. Zulkarnain and Mr. Agus Yudhi Pristianto as the current supervisor for the support and guidance on the program development, and give me a chance to join SnT 2023.



INTRODUCTION

OBJECTIVES

METHODS/DATA

RESULTS

CONCLUSION



Please do not use this space, a QR code will be automatically overlaid

Px.x-xxx