

**CENTER FOR RADIATION SAFETY TECHNOLOGY  
AND METROLOGY**

**[(PUSAT TEKNOLOGI KESELAMATAN DAN  
METROLOGY RADIASI (PTKMR))]**

**NATIONAL NUCLEAR ENERGY AGENCY  
INDONESIA (NNEA)**

**[BADAN TENAGA NUKLIR INDONESIA (BATAN)]**

**Hasnel Sofyan**

**Dosimetry for Personnel and Patient Group**

**Division of Occupational Safety and Dosimetry**



# NATIONAL NUCLEAR ENERGY AGENCY

1. BATAN Center Office, Kuningan Barat, Mampang Prapatan JAKARTA
2. Pasar Jumat Nuclear Area, South Jakarta

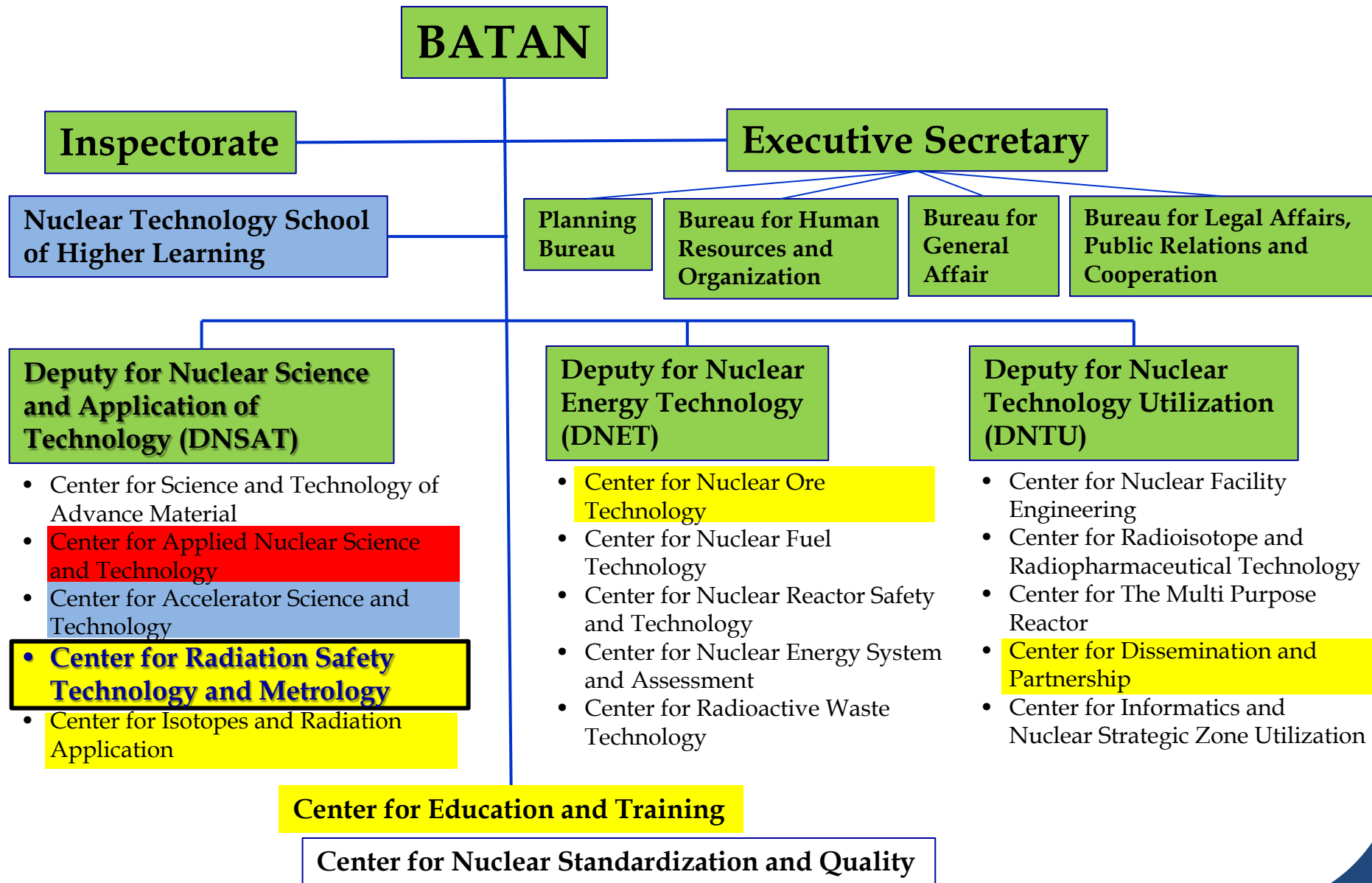


Serpong Nuclear Area,  
Banten  
250 km

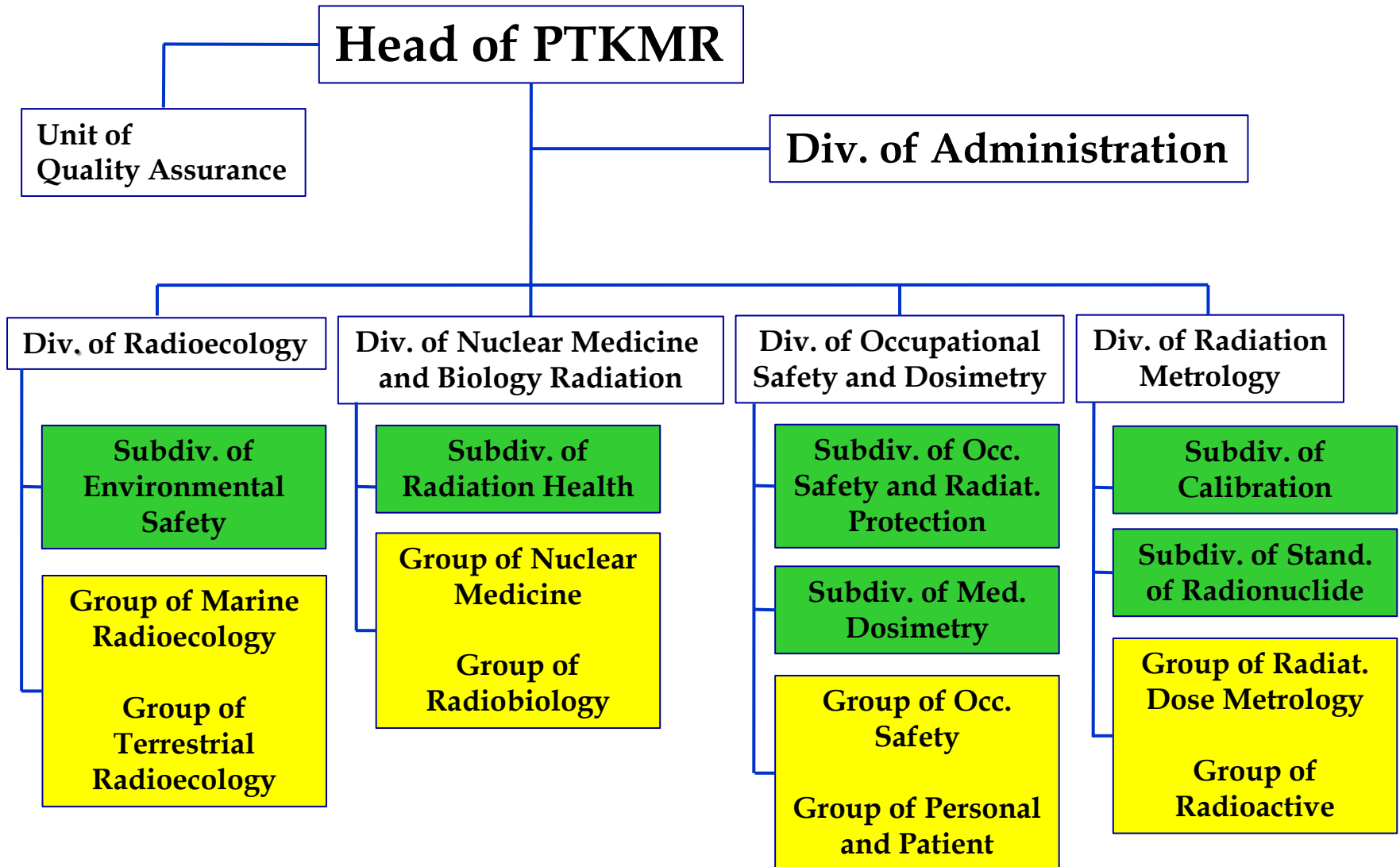
Bandung Nuclear Area,  
Taman Sari Street Bandung,  
West Java

Yogyakarta Nuclear Area,  
Babarsari Street Yogyakarta

# Organization Structure



# Organization Structure



# CRSTM or PTKMR

- ✓ The **Center for Radiation Safety Technology and Metrology (PTKMR)** is one of 5 research centers under **Deputy for Nuclear Science and Application of Technology**, consist of;
- ✓ **Division of Administration**
- ✓ **Division of Radioecology** (**Subdiv of Environmental Safety; Radioecological Marine Group, Radioekological Terrestrial Group**)
- ✓ **Division or Nuclear Medicine Technology and Radiation Biology** (**Subdivision of Radiation Health; Nuclear Medicine Technology Group, Radiobiology Group**)
- ✓ **Division of Occupational Safety and Dosimetry** (**Subdiv. Occupational Safety and Radiation Protection, Subdiv. Medical Dosimetry; Dosimetry for Radiation Safety Group, Dosimetry for Personal and Patient Group**)
- ✓ **Division of Metrology Radiation** (**Subdiv of Calibration for Radiation Measurement, Subdiv of Radionuclide Standardization; Radiation Dose Metrology Group, Radioactive Metrology Group**)

## The Division of Occupational Safety and Dosimetry

### Research and Development in 2019

1. Measurement of patient doses due to medical radiation in several big hospitals (continued) → TLD LiF:Mg,Ti
2. Monitoring of natural radiation exposure in West Sulawesi Province (Mamuju areal) using OSLD (continued)
3. *Uncertainty evaluation of measurement of entrance surface dose (ESD) in patients using OSL Dosimeters nanoDots ( $Al_2O_3:C$ )*
4. *OSLD Intercomparison for  $H_p(10)$*

**Human Resources:** 27 persons

# CRSTM or PTKMR Facilities/Equipment batan



CALIBRATOR OB-85/ BUCHLER



TLD READER HARSHAW MODEL 6600



TLD READER TYPE TL 1010

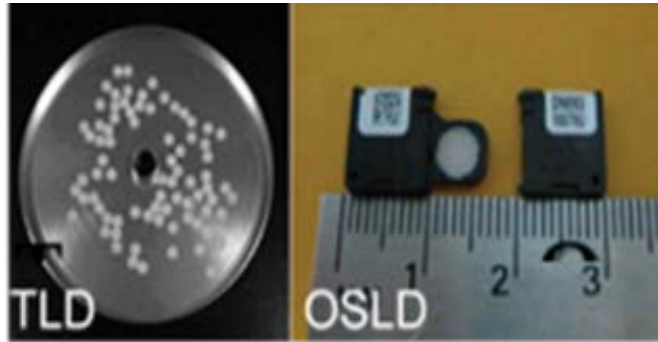


Harshaw TLD Badge



BARC TLD Badge

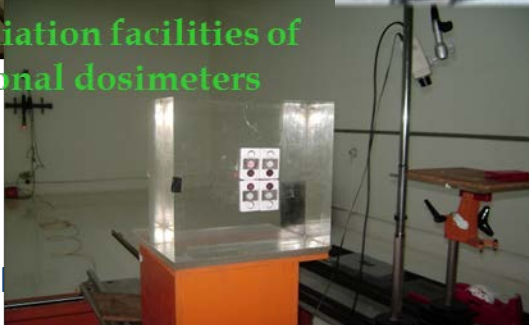
# CRSTM or PTKMR, Facilities/Equipment batan



OSLD microStar reader System



Irradiation facilities of personal dosimeters





# CRSTM or PTKMR, Number of Services batan

The main task → to perform services in the field of occupational safety and radiation protection (TLD Badge Harshaw and BARC)



→ TLD Badge Harshaw (7,758 TLDs)

→ TLD Badge BARC (16,510 TLDs)

} **in 2018**

**Others → ± 50.000 to 60.000 using TLD BARC**

**Estimates for the future;**

TOTAL		2015	2020	2025
Population (x 1000)		255,462	270,857	284,830
Hospitals		2,488	2,927	3,394

Sources: Health Ministry of Indonesian, Central Bureau of Indonesian

**52% in Java**  
**7% in Jkt**

## Metrological Traceability

Has been accredited by;

1. National Accreditation Committee (KAN) based on SNI ISO/IEC 17025: 2017 for Testing Laboratories (No. LP-206-IDN) and Calibration Laboratories (No. LK-142-IDN),
2. Sucofindo International Certificate Services SNI/ISO 9001: 2015 for Quality Management Systems (No. QSG01569),
3. OHSAS 18001: 2007 for Occupational Safety and Health Systems (No. OSH02214), and
4. National Committee of Accreditation for Research and Development Institutions (KNAPPP) based on KNAPPP Guidelines 02: 2017 for Nuclear Health (No. PL 022-INA).

## Challenges in the future

- ✓ Probability to replace TLD to OSL Dosimeter
- ✓ R & D of practical methods for regular monitoring
- ✓ R & D of better techniques to estimate eye lens dose using OSLD nanoDots and then for services
- ✓ Budgeting for research

**THANK YOU FOR YOUR ATTENTION**

**TERIMAKASIH ATAS PERHATIANNYA**

**ありがとうございます**

A photograph of a modern, multi-story building with a white facade and yellow accents. The building has several balconies and windows. In the foreground, there is a sign for the 'PUSAT TEKNOLOGI KESELAMATAN DAN METROLOGI RADIASI'. The sign is dark brown with white text and a logo on the left. The building is surrounded by greenery, including palm trees and other plants. The sky is clear and blue.

**PUSAT TEKNOLOGI KESELAMATAN  
DAN METROLOGI RADIASI**