Status of National Arrangements on Dose Registry

“Regulatory provisions on NDR & its’ implementation”

Ida Bagus Gede Putra Pratama
Nuclear Energy Regulatory Body of Indonesia (BAPETEN)
Indonesia

REGIONAL WORKSHOP ON ON THE MANAGEMENT OF NATIONAL DOSE REGISTRIES
20 – 24 March 2023, Bangkok / Thailand

Legal Basis- Regulatory provisions

PRESIDEN
REPUBLIK INDONESIA

UNDANG-UNDANG REPUBLIK INDONESIA

NOMOR 10 TAHUN 1997

TENTANG

KETENAGANUKLIRAN

Act No. 10 Year 1997 on Nuclear Energy

Article 15 letter b:

- BAPETEN as Regulatory Body has been empowered to ensure the safety and health for worker and member of public as well as protection of the environment.

Article 16 para (1):

- Every activities related to nuclear energy must pay attention to safety, security, peace, worker and member of public health, as well as protection of the environment.

Legal Basis- Regulatory provisions

PRESIDEN
REPUBLIK INDONESIA

PERATURAN PEMERINTAH REPUBLIK INDONESIA
NOMOR 33 TAHUN 2007
TENTANG
KESELAMATAN RADIASI PENGION DAN
KEAMANAN SUMBER RADIOAKTIF

GR No. 33 Year 2007 on Ionizing Radiation Safety and Radioactive Source Security Article 29 para (1) & (2)

- Licensee should perform dose monitoring to the radiation worker.
- Radiation doses of workers shall be evaluated by accredited dosimetry laboratory and submit the report of dose monitoring result to Licensee and BAPETEN.

KEPALA BADAN PENGAWAS TENAGA NUKLIR
REPUBLIK INDONESIA

PERATURAN KEPALA BADAN PENGAWAS TENAGA NUKLIR
NOMOR 11 TAHUN 2015
TENTANG
LABORATORIUM DOSIMETRI EKSTERNA

BAPETEN Chairman Regulation (BCR) No. 11 Year 2015 on External Dosimetry Laboratory Article 44 para (2)

- Report of personal dose evaluation should be delivered to BAPETEN Chairman by online system provided by BAPETEN.

Legal Basis- Regulatory provisions

BAPETEN has created an online application called **Balis Pendora** (Recording Radiation Dose of Workers) as **National Dose Registry** in order to facilitates monitoring evaluation results of radiation dose of worker.

Balis Pendora also facilitates licensees to submit a **notification letter of overdose worker** and to upload documents as the result of internal investigation.

Requirement for authorization of the NDR

1. Electronic system should be available and stable in accordance to keep and maintain occupational dose records.

2. Reliable cyber security system should be available to keep sensitive data from being misused.

3. Occupational record should be reported using standard format provided by Regulatory Body.

4. Occupational record should be informed to Licensee.

Criteria for Authorization of Dosimetry Services

BCR No No. 11 Year 2015 regulate about the requirement of the mechanism of registration and designation of external dosimetry which accordance with **ISO/IEC 17025:2017** on General Requirements for the Competence of Testing and Calibration Laboratory.

Dosimetry services should be **accredited by National Accreditation Committee of Indonesia (KAN)** and registered in BAPETEN. **Accreditation is valid for 5 years.**

Technical Service Providers (TSPs) in Indonesia

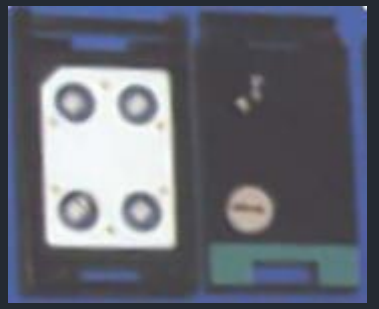
Type of service	Number of Authorized Providers
External dosimetry	11
Internal dosimetry	0
Calibration for individual monitoring	5
Calibration for workplace monitoring equipment	5
Calibration and verification of radiation sources	1

NDS is designed as reporting system for dosimetry laboratory

Radiation type	Basic Criteria
Photon monitoring	depend on energy, type of radiation and response time
Beta monitoring	depend on energy, type of radiation and response time
Neutron monitoring	depend on energy, type of radiation and response time

Personal dosimeter types provided:

- Thermoluminescent Dosimeter (TLD)
- Optically Stimulated Luminescence (OSL)
- Film
- Active Personal Dosimeter



External dosimetry laboratory in Indonesia

External dosimetry laboratory	Evaluation services
Balai Pengamanan Fasilitas Kesehatan (BPFK) Surabaya	TLD Hp(10) & Hp(3)
Balai Pengamanan Fasilitas Kesehatan (BPFK) Jakarta	TLD Hp(10), Hp(3), & Hp(0.07)
Balai Pengamanan Fasilitas Kesehatan (BPFK) Makassar	TLD Hp(10) & Hp(3)
Balai Pengamanan Fasilitas Kesehatan (BPFK) Medan	TLD Hp(10)
Loka Pengamanan Fasilitas Kesehatan (LPFK) Surakarta	Film Badge; TLD Hp(10) & Hp(3)
Loka Pengamanan Fasilitas Kesehatan (LPFK) Banjarbaru	TLD Hp(10) & Hp(3)
PT. Maqass Techrad Indonesia	OSL Hp(10) & Hp(0.07)
PT. Alypz International Indonesia	OSL Hp(10) & Hp(0.07)
Laboratorium Pemantauan Dosis Personel dan Lingkungan (PDPL), DPLFRKST-BRIN	TLD Hp(10)
Nuklindo Koperasi Jasa Keselamatan Radiasi dan Lingkungan	TLD Hp(10), Hp(3), & Hp(0.07)
Laboraturium Teknologi Keselamatan dan Metrologi Radiasi (LTKMR) - BRIN	TLD Hp(10), Hp(3), & Hp(0.07) OSL Hp(10), Hp(3), & Hp(0.07)

Internal dosimetry laboratory in Indonesia

Indonesia is on process to develop infrastructure, regulation, and facilities for internal dosimetry laboratory.

Dosimetry service characteristics

Monitoring periods used for external dosimetry:

- External dosimeter should be analysed quarterly (every 3 Months) for TLD and OSL; and every month for film dosimeter.

Calibration procedures for external dosimetry:

- Calibration procedure developed by National Research and Innovation Agency (BRIN) as SSDL of Indonesia.
- All dosimetry laboratories perform calibration based on procedures developed by SSDL.
- Intercomparison was organized by SSDL to carry out evaluations of inter-lab dosimetry minimum once every 3 years.

Extremity dosimetry: 3 external dosimetry laboratories are eligible to perform evaluation for extremity dosimetry.

Monitoring requirements for emergency exposure

- In case of emergency exposure situation, accident report should be delivered to BAPETEN by Licensee which contain of the cause of the accident and corrective action performed.

- If dose limit for worker is exceeded, dosimetry laboratory must inform evaluation report into BAPETEN maximum 3 working days since the result occur.

- The licensee is also responsible for providing information about the dose received and the consequences of the health risk to the response officer.

Provision for Quality Management System for TSPs

Provision for Quality Management System for TSP in Indonesia based on accreditation **ISO/IEC 17025:2017** on General Requirements for the Competence of Testing and Calibration Laboratory by **National Accreditation Committee of Indonesia (KAN)** and registered in BAPETEN.

Qualified staff in TSP should have competitions:

1. Able to understand ISO/IEC 17025:2017 on General Requirements for the Competence of Testing and Calibration Laboratory;
2. Able to do evaluation and calibration based on the services provided by laboratory.
3. Able to implement Quality Assurance and Quality Control based on the services.

Training for qualified staff should be relevant with the services in the laboratory and according to type of equipment used.

General characteristics of the NDR

B@LIS ONLINE Pendora

Balis Pendora was **established** on **2017** by **BAPETEN** as Regulatory Body in Indonesia.

- Balis Pendora is a NDR integrated with Dosimetry Laboratory, Licensing and Inspection system. It helps dosimetry laboratories to managing reports of TLD/FB test results so as to distribute of test result reports to Licensee and BAPETEN.
- NDR data is used for tracking accumulation dose in 1 year and 5 years for worker.

General characteristics of the NDR

Occupational Categories:

- Medical Staff
- Staff in Industrial Facilities
- Staff in Research Reactor

Dosimetry Laboratory is responsible to submit required information to Balis Pendora. Evaluation report provided to BAPETEN and Licensee.

General characteristics of the NDR

Information is required by the NDR:

1. Dosimetry Laboratory Name and Address;
2. Report Title;
3. Report's Serial Number;
4. Licensee Name and Address;
5. Received Dosimeter Date;
6. Evaluation of Dosimeter Date;
7. Dosimeter Usage Time Period;
8. Worker ID Number;
9. Worker Name;
10. Evaluation Result in the Usage Time Period;
11. Hp(d);
12. Individual Dosimeter lowest detection limit;
13. Name, Position, and signature of the person authorizing the report

General characteristics of the NDR

Types of doses are recorded in the NDR: HP (10) for deep dose, HP (3) for eye lens dose and HP (0.07) for shallow dose

Procedure applicable for overexposure and/or in an emergency situation:

- Accident report should be delivered to BAPETEN by Licensee which contain of the cause of the accident and corrective action performed
- If dose limit for worker is exceeded, dosimetry laboratory must inform evaluation report into BAPETEN maximum 3 days since the result occur.
- The licensee is also responsible for providing information about the dose received and the consequences of the health risk to the response officer.

General characteristics of the NDR

Time period for submitting data to the NDR:

- Evaluation of occupational exposure should be reported to BAPETEN and Licensee maximum 30 working days since received dosimeter date;
- Evaluation should be reported maximum 3 working days to BAPETEN for evaluation result exceeded occupational dose limit.

Retainment period of the NDR data:

- 30 years after cessation of the work in which the worker was subject to occupational exposure

Number of currently registered occupationally exposed workers:

- 70,790 workers since 2017

General characteristics of the NDR

Management system of the NDR:

- NDR system is administered and developed by the Directorate of Inspection of Nuclear Installations and Materials in BAPETEN;
- Database system and maintenance arrangements is implemented by Function Group of Data and Information in BAPETEN

Difficulties when establishing the NDR:

- The Licensee does not notify to the Directorate of Licensing regarding of workers who stop working in the facility.
- Some Licensee does not routinely submit requests for personal dosimeter evaluations.

Reporting mechanism to occupationally exposed workers or organisations:

- Online system on Balis Pendora

Report format

DOSIMETRY LABORATORY .....

Address. .....

Telp. ....., Fax....., Email.....

EVALUATION REPORT OF FILM DOSIMETER (FILM BADGE)/ THERMOLUMINIENCE DOSIMETER (TLD BADGE)/ OSL DOSIMETER (OSL BADGE)

Number: .....

Licensee Name and Address: Name ..... Address	Received Dosimeter Date: .... Evaluation of Dosimeter Date: ....

Dosimeter Usage Time Period: ..... to .....

No.	ID Number	Worker Name	Dose (mSv)		
			$(H_p(d))^a$ $H_p(10)$	$(H_p(d))^a$ $H_p(0,07)$	$(H_p(d))^a$ $H_p(3)$
1	...	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...
...	...	...	...	...	...

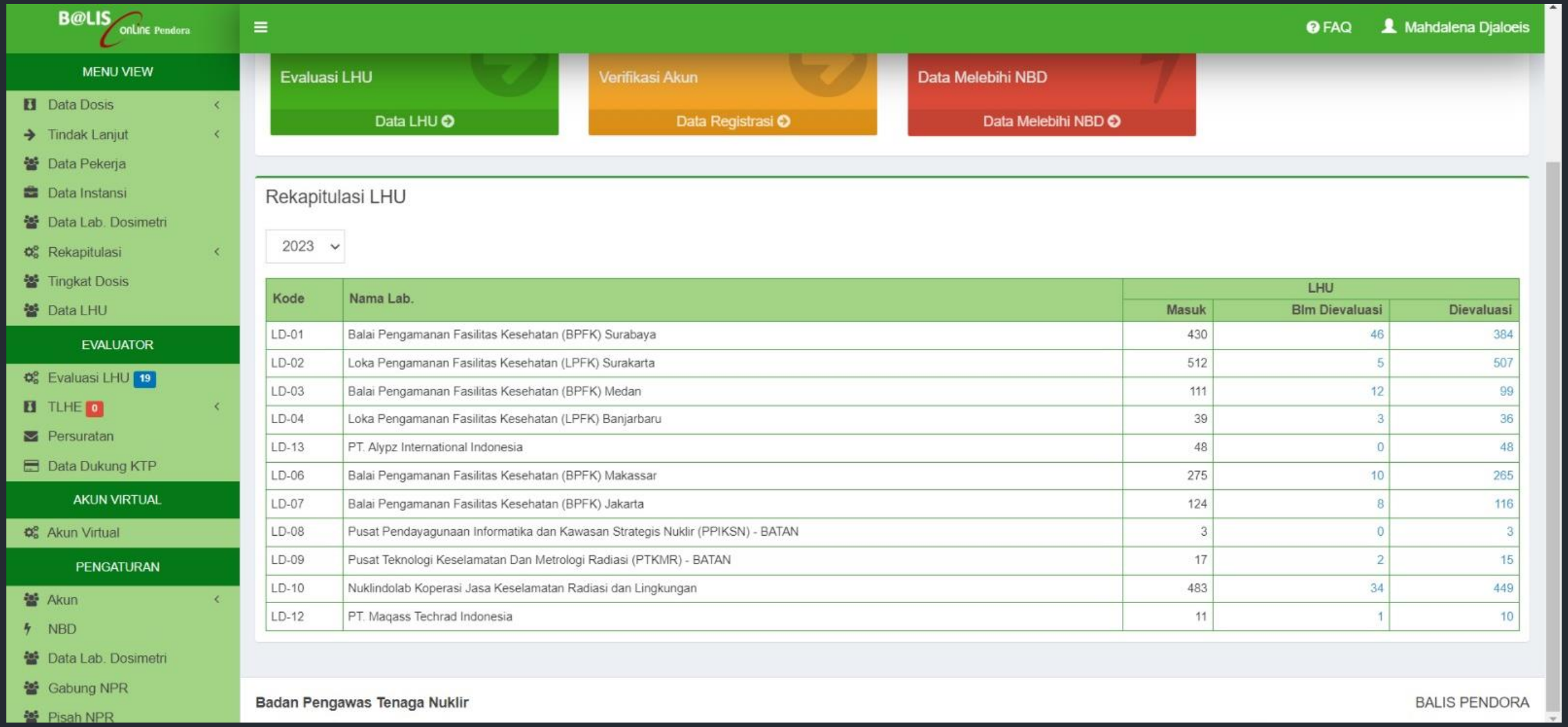
Individual Dosimeter lowest detection limit[b]: ...

Name

Position

Sign

Samples of the analysis on NDR



Kode	Nama Lab.	LHU		
		Masuk	Blm Dievaluasi	Dievaluasi
LD-01	Balai Pengamanan Fasilitas Kesehatan (BPFK) Surabaya	430	46	384
LD-02	Loka Pengamanan Fasilitas Kesehatan (LPFK) Surakarta	512	5	507
LD-03	Balai Pengamanan Fasilitas Kesehatan (BPFK) Medan	111	12	99
LD-04	Loka Pengamanan Fasilitas Kesehatan (LPFK) Banjarbaru	39	3	36
LD-13	PT. Alypz International Indonesia	48	0	48
LD-06	Balai Pengamanan Fasilitas Kesehatan (BPFK) Makassar	275	10	265
LD-07	Balai Pengamanan Fasilitas Kesehatan (BPFK) Jakarta	124	8	116
LD-08	Pusat Pendayagunaan Informatika dan Kawasan Strategis Nuklir (PPIKSN) - BATAN	3	0	3
LD-09	Pusat Teknologi Keselamatan Dan Metrologi Radiasi (PTKMR) - BATAN	17	2	15
LD-10	Nuklindolab Koperasi Jasa Keselamatan Radiasi dan Lingkungan	483	34	449
LD-12	PT. Maqass Techrad Indonesia	11	1	10

Samples of the analysis on NDR

Nama Instansi	BLU RSUD Kota Malang (fasid:9020)
Alamat	Jl. Rajasa No. 27 Bumiayu Kedungkandang (alamatid:28900)
No MP	03395 (id:37655)

Dosis (mSv)

Tahun	Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agust	Sept	Okt	Nov	Des	Akum/th	Akum/5th
2023	x	x	x	x	x	x	x	x	x	x	x	x	x	3.06
2022	x	x	x	x	x	x	0.21			0.18			0.39	3.06
2021	0.19			0.19			0.20			x	x	x	0.58	2.67
2020	0.19			0.17			0.19			0.20			0.75	2.09
2019	0.18			0.18			0.15			0.16			0.67	1.34

Total Akumulasi Dosis

Tahun	Dosis (mSv) akum/th	Dosis (mSv) akum/5th
2023	x	4.00
2022	0.80	4.00
2021	0.74	3.20
2020	0.75	2.46
2019	0.68	1.71