

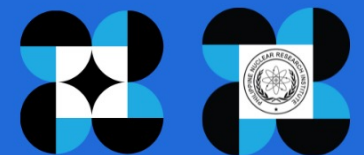
Status of National Arrangements on Dose Registry

“Regulatory provisions on NDR & its’ implementation”

KRISTINE MARIE R. DEAN
MAY A. VITUG

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Philippine Nuclear Research Institute
Philippines

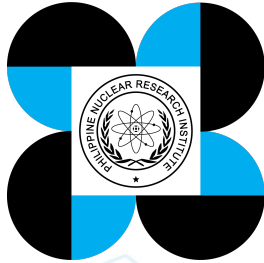
REGIONAL WORKSHOP ON ON THE MANAGEMENT OF NATIONAL DOSE REGISTRIES
20 – 24 March 2023, Bangkok / Thailand



Legal Basis & Regulatory Provisions



Two Regulatory Agencies



Philippine Nuclear Research Institute (PNRI)

- Under the Department of Science & Technology
- Regulation, licensing and safeguards of radioactive materials and atomic energy facilities



Center for Device Regulation, Radiation Health & Research (CDRRHR)

- Under the Department of Health - Food and Drug Administration
- Regulation and radiation safety of electrically produced ionizing radiation including non-ionizing radiation



Legal Basis

REPUBLIC ACT No. 2067, (AS AMENDED BY REPUBLIC ACT No. 3589)

- authorized issuance and promulgation of rules, regulations or orders for regulation of activities involving radioactive materials (PNRI)

Executive Order No. 102 & Republic Act 9711

- “ Redirecting the Functions and Operations of the Department of Health”- RHS was renamed the “ Bureau of Health Devices and Technology” and given the additional function of regulating medical and health related devices (CDRRHR)

REPUBLIC ACT No. 5207 (AS AMENDED BY PRESIDENTIAL DECREE No. 1484)

- authorized establishment of licensing and issuance of regulations and orders with respect to atomic energy facilities and materials for the protection of the health. and safety of the workers and of the general public



Regulatory Provisions for Dosimetry Services

DOST-DOH Memorandum of Agreement (2020) - Strengthening the monitoring and assessment of occupational exposure by **establishing a national dose registry**, a centralized repository of dose records of all monitored radiation workers, and accreditation and recognition of Personal Dosimetry Service Providers

DOH (FDA) Administrative Order No. 2022-0022 – requires that **dosimetry service providers are approved** and must operate under a quality management system (Annex A, Part 4, Section F.1)

Code of PNRI Regulation (CPR) Part 3 - requires that **dosimetry services providers must be PNRI recognized/approved** and must operate under a quality management system (Sec. 29.1.c and Sec. 31.a)

ADMINISTRATIVE ORDER NO. 1 Series of 2015 - adoption of the IAEA General Safety Requirements (GSR) Part 3

CPR Part 25 - “Licenses for Commercial Providers of Nuclear Technical Services”, The requirements for Personnel Dosimetry

CPR Part 25, Sec 24 – Direct reading dosimeter or similar device and either thermoluminescent (TLD) or Optically Stimulated Luminescence (OSL) dosimeter if necessary are required for personnel monitoring during operations



Monitoring for Emergency Exposures

CPR Part 3 Rev.02

Section 29. Individual Monitoring.

29.1. External Exposure.

- (a) The licensee shall monitor the external exposure of individuals working in a controlled area and those individuals entering a high radiation area.

Section 32. Records of Occupational Exposures

- (a) The licensee shall maintain records of occupational exposure for each worker for whom assessment of occupational exposure is required
- (c) Records of occupational exposure shall include: (1) Information on the general nature of the work in which the worker was subject to occupational exposure;
 - (4) Records of any assessment of doses, exposures and intakes due to actions taken in an emergency or due to accidents or other incidents, which shall be distinguished from doses, exposures and intakes due to normal conditions of work and which shall include references to reports of any relevant investigations

Section 21. Inventory and Records.

- (a) The licensee shall establish, maintain and be able to retrieve records relating to:
 - (2) Records of doses from occupational exposures



Provision for Quality Management System for TSPs

CPR Part 25

Section 16 (a) and (b) - For certification

- a) Each licensee shall **acquire ISO certification** or its equivalent within two (2) years after the issuance of the initial license
 - b) Each licensee shall **establish and maintain a written quality management program** to provide high confidence that services rendered satisfy its clients.
-

Section 19 - For qualification of Radiation Protection Officer and Assistant RPO

Holds a bachelor of Science Degree, has completed Radiation Protection Course and has completed course conducted by a training provider

Section 21 (d) - For **training of authorized personnel for personnel dosimetry service** -

Participated in Intercomparison Programs for dosimetry reliability and accuracy given by the International Atomic Energy Agency and other Member States [or from a Metrological Institution]; and

- 1) Three (3) months of actual work experience on personnel dosimetry services.



Dosimetry Services



Operational Technical Service Providers (TSPs)

Services for protection and safety of workers & public

PNRI

Nagase Philippines

TUV Rheinland

Individual
Monitoring



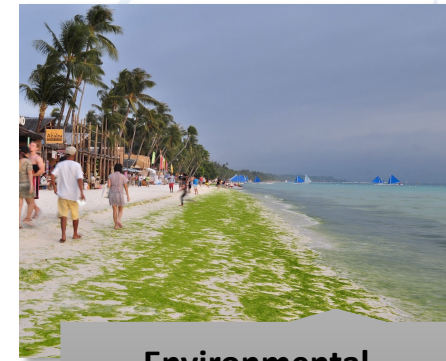
Radiation Protection
Services



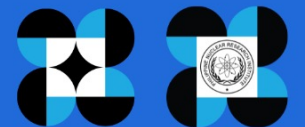
Microbiological Testing
& Biodosimetry



Nuclear Analytical
Techniques Services



Environmental
Monitoring



Operational Technical Service Providers (TSPs)

Services for protection and safety of workers & public

PNRI

Nagase Philippines

TUV Rheinland



Calibration



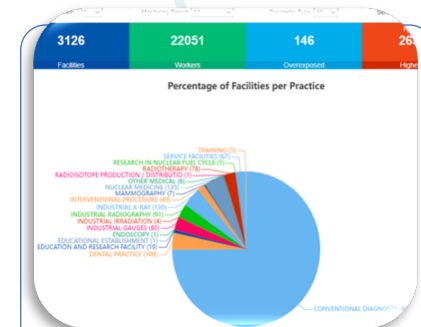
Individual Monitoring



Radiation Control



Radioactive Waste Management



Dose registry



Hazards Evaluation

External Dosimetry Service characteristics

Monitoring periods used

- 1 - 2 months

Calibration procedures

- Annual (OSL Reader)
- Semi-Annual (for Reader), Annual for Cards (ECC)
- PNRI - Conducted in-house following approved procedures

Extremity dosimetry

- Ring dosimeters
- TLD – TLD-100
- OSL - Nanodots

Radiation types monitored

- Beta, gamma, X-rays
- Neutron (OSL, TLD)

Quality Management System

- ISO 17025 for OSL and TLD Whole body external dosimetry
- ISO9001 for other services



External Dosimetry Service characteristics

Monitoring periods used

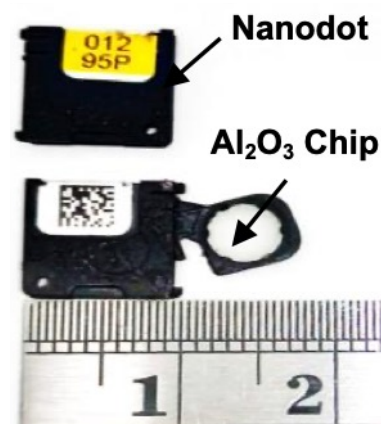
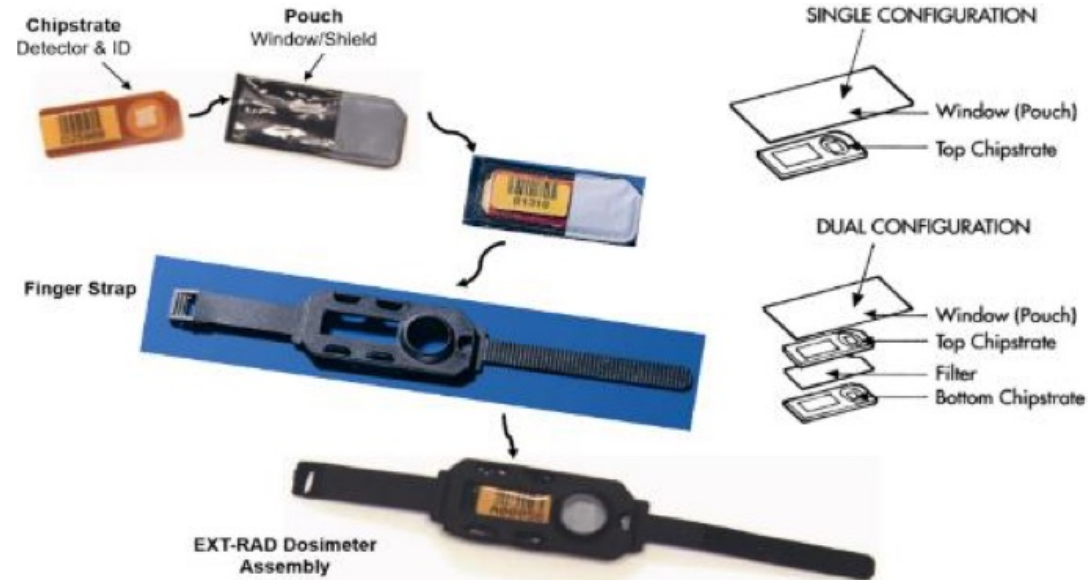
- 1 - 2 months

Calibration procedures

- Annual (OSL Reader)
- Semi-Annual (for Reader), Annual for Cards (ECC)
- PNRI - Conducted in-house following approved procedures

Extremity dosimetry

- Ring dosimeters
- TLD – TLD-100
- OSL - Nanodots



Internal Dosimetry Service – Under development

System

- A whole body counting system, WBC-FASTSTAND-S consisting of sodium iodide (NaI) detectors

Calibration procedures

- Ongoing for energy, MDA and efficiency calibrations

Dose assessment procedure

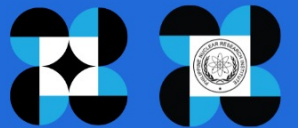
- To be developed

Internal Dosimetry Laboratory



Characteristics of the Dose Registry (PHILDOSE)

No NDR in PH yet



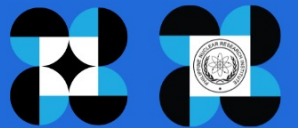
PhilDose

Philippine Dose Registry of Occupationally Exposed Workers



<https://services.pnri.dost.gov.ph/registry/>

- A web-based system that tracks occupational dose exposures (dose histories) of workers and the facilities they worked with
- Started in June 2018, fully implemented in 2019
- Developed & implemented by the Radiation Protection Services Section - PNRI





PhilDose

- Contain occupational exposures in terms of **Personal Dose Equivalent quantities** in unit of milli-Sievert (mSv):
 - ✓ Hp(10) – dose to the **whole body** due to strongly penetrating radiation
 - ✓ Hp(0.07) – dose to the **skin**
 - ✓ Hp(3) – dose to the **eye lens**
- Dose from exposures to **photon, beta & neutron** radiation
- Dose records of the PNRI OSLD and TLD Individual Monitoring Services only

Categorized according to nature of application

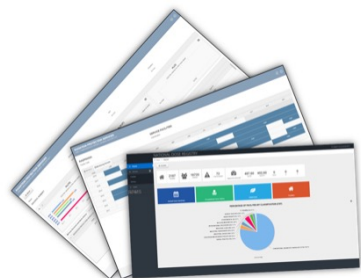
Nuclear medicine	Conventional diagnostic radiology
Radiotherapy	Interventional procedures
Dental Practice	Industrial radiography
Industrial gauges	Miscellaneous applications (e.g. education, services, waste mgnt)





PHILDOSE

Philippine Dose Registry of Occupationally Exposed Workers.



Lists

Provides a registry of occupationally exposed workers in the country, their affiliated facilities and their exposure records.



UNSCEAR

Report levels of radiation exposures of workers as part of the country's commitment to the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR).



Occupational Exposure Profiles

Provides dose exposure profiles in just a click away



Reports

Generates worker's Occupational Exposure History (OEH), facility's Annual Dose Summary (ADS), and more!



Overexposure

Identifies and notifies incidents of exposures that are above the regulatory limits



Filter by Year: All

Monitoring Period: All

Dosimeter Type: All

Service Provider: All

3134

Facilities

22121

Workers

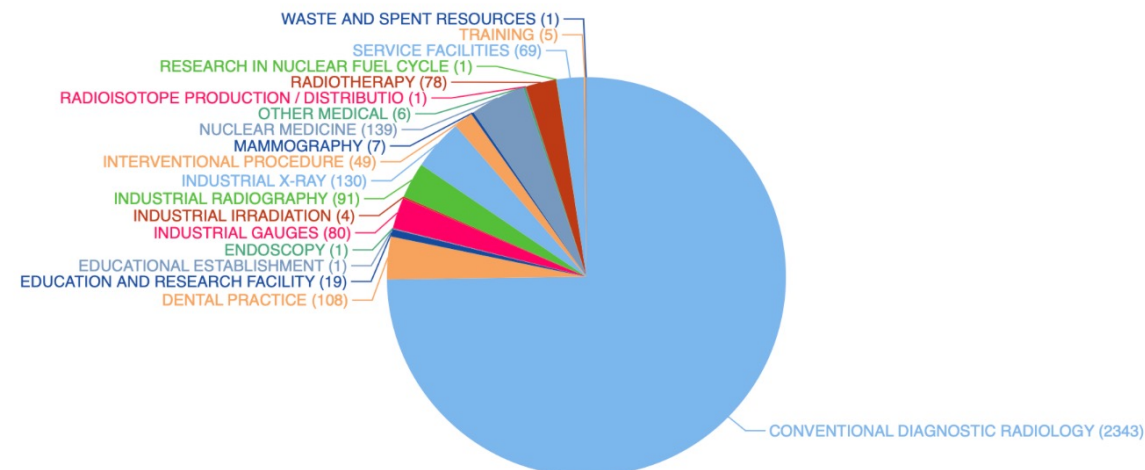
157

Overexposed

H_p(10)
2635.11

Highest Dose

Percentage of Facilities per Practice



OCCUPATIONAL EXPOSURE HISTORY

1. Name: [REDACTED]
 2. ID: INAB006691
 3. Employer(s): [REDACTED]

RADPN0094 - SERVICE FACILITIES
 2012 - 2019

REM9151 - SERVICE FACILITIES
 2012

4. Request No:

5. Date of Report: Oct 28, 2019

6. Dose History (mSv)

n/m - Not Monitored
 < MDL - Readings below 0.1 mSv

	Effective Dose	Equivalent dose to the extremities or to the skin	Equivalent dose to the lens of the eyes
Dose received from the start of monitoring up to the end of last calendar year	3.97	6.73	n/m
Dose received during the last five calendar years	2.51	6.54	n/m
Dose received during current calendar year	0.12	0.12	n/m

ANNUAL DOSE SUMMARY

Year	Hp(10)		Hp(0.07)			Hp(3)
	Photon	Neutron	Photon	Beta		
2012	0.12	n/m	< MDL	n/m		n/m
2013	1.22	n/m	< MDL	n/m		n/m
2014	< MDL	n/m	< MDL	n/m		n/m
2015	0.44	n/m	< MDL	n/m		n/m
2016	< MDL	n/m	< MDL	n/m		n/m
2017	0.21	n/m	4.69	n/m		n/m
2018	1.86	n/m	1.85	n/m		n/m
2019	0.12	n/m	0.12	n/m		n/m

Annual Dose Summary 2018

Facility: RADIATION PROTECTION SERVICES
 Address: PNRI, COMMONWEALTH AVENUE, DILIMAN, QUEZON CITY
 Service Provider(s): PNRI-OSL

Facility Code: RADPN0094
 Classification: SERVICE FACILITIES

#	Name	Dose (mSv)	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	TOTAL
1	[REDACTED]	Hp(10)												0.11	0.11
		Hp(0.07)												0.11	0.11
		Hp(3)												n/ m	0.00
		B												n/ m	0.00
		n												n/ m	0.00
2	[REDACTED]	Hp(10)						0.00							0.00
		Hp(0.07)						0.00							0.00
		Hp(3)						n/ m							0.00
		B						n/ m							0.00
		n						n/ m							0.00
3	[REDACTED]	Hp(10)		0.00		0.00				0.00		0.00		0.00	0.00
		Hp(0.07)		0.00		0.00				0.00		0.00		0.00	0.00
		Hp(3)		n/ m		n/ m				n/ m		n/ m		n/ m	0.00
		B		n/ m		n/ m				n/ m		n/ m		n/ m	0.00
		n		n/ m		n/ m				n/ m		n/ m		n/ m	0.00
4	[REDACTED]	Hp(10)		0.00		0.00		0.28		0.00		0.00		0.10	0.38
		Hp(0.07)		0.00		0.00		0.26		0.00		0.00		0.10	0.36



For FREE!
You can apply Online!

OTHER FEATURES (1)

Generates **REPORTS** of a) worker's occupational exposure history, & b) facility's annual dose summary

230 requests since 2019



OCCUPATIONAL EXPOSURE HISTORY

1. Name: [REDACTED]

2. ID: INAB006691

3. Employer(s):

[REDACTED]
RADPN0094 - SERVICE FACILITIES
2012 - 2019

[REDACTED]
REM9151 - SERVICE FACILITIES
2012

4. Request No:

5. Date of Report: Oct 28, 2019

6. Dose History (mSv)

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	Effective Dose	Equivalent dose to the extremities or to the skin	Equivalent dose to the lens of the eyes
Dose received from the start of monitoring up to the end of last calendar year	3.97	6.73	n/m
Dose received during the last five calendar years.	2.51	6.54	n/m
Dose received during current calendar year.	0.12	0.12	n/m

ANNUAL DOSE SUMMARY

Year	Hp (10)		Hp (0.07)		Hp (3)
	Photon	Neutron	Photon	Beta	
2012	0.12	n/m	< MDL	n/m	n/m
2013	1.22	n/m	< MDL	n/m	n/m
2014	< MDL	n/m	< MDL	n/m	n/m
2015	0.44	n/m	< MDL	n/m	n/m
2016	< MDL	n/m	< MDL	n/m	n/m
2017	0.21	n/m	4.69	n/m	n/m
2018	1.88	n/m	1.85	n/m	n/m
2019	0.12	n/m	0.12	n/m	n/m



Annual Dose Summary 2018

Facility: RADIATION PROTECTION SERVICES
Address: PNRI, COMMONWEALTH AVENUE, DILIMAN, QUEZON CITY
Service Provider(s): PNRI-OSL

Facility Code: RADPN0094
Classification: SERVICE FACILITIES

#	Name	Dose (mSv)	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	TOTAL
1		Hp(10)												0.11	0.11
		Hp(0.07)												0.11	0.11
		Hp(3)												n/ m	0.00
		B												n/ m	0.00
		n												n/ m	0.00
2		Hp(10)						0.00							0.00
		Hp(0.07)						0.00							0.00
		Hp(3)						n/ m							0.00
		B						n/ m							0.00
		n						n/ m							0.00
3		Hp(10)		0.00		0.00				0.00		0.00		0.00	0.00
		Hp(0.07)		0.00		0.00				0.00		0.00		0.00	0.00
		Hp(3)		n/ m		n/ m				n/ m		n/ m		n/ m	0.00
		B		n/ m		n/ m				n/ m		n/ m		n/ m	0.00
		n		n/ m		n/ m				n/ m		n/ m		n/ m	0.00
4		Hp(10)		0.00		0.00		0.28		0.00		0.00		0.10	0.38
		Hp(0.07)		0.00		0.00		0.26		0.00		0.00		0.10	0.36

Doses received
are **ABOVE THE
LIMITS!!**



<https://services.pnri.dost.gov.ph/registry/>

#	Name	Year	H _p (10)	Notify
1		2019	40.15 mSv	Notify
2		2019	23.9 mSv	Notify
3		2019	53.48 mSv	Notify
4		2019	25.6 mSv	Notify
5		2018	35.25 mSv	Notify
6		2018	21.68 mSv	Notify
7		2018	32.67 mSv	Notify
8		2018	51.12 mSv	Notify

OTHER FEATURES (2)

It identifies and notifies incidents of **OVEREXPOSURE** (i.e. doses exceeding the action & regulatory limits).



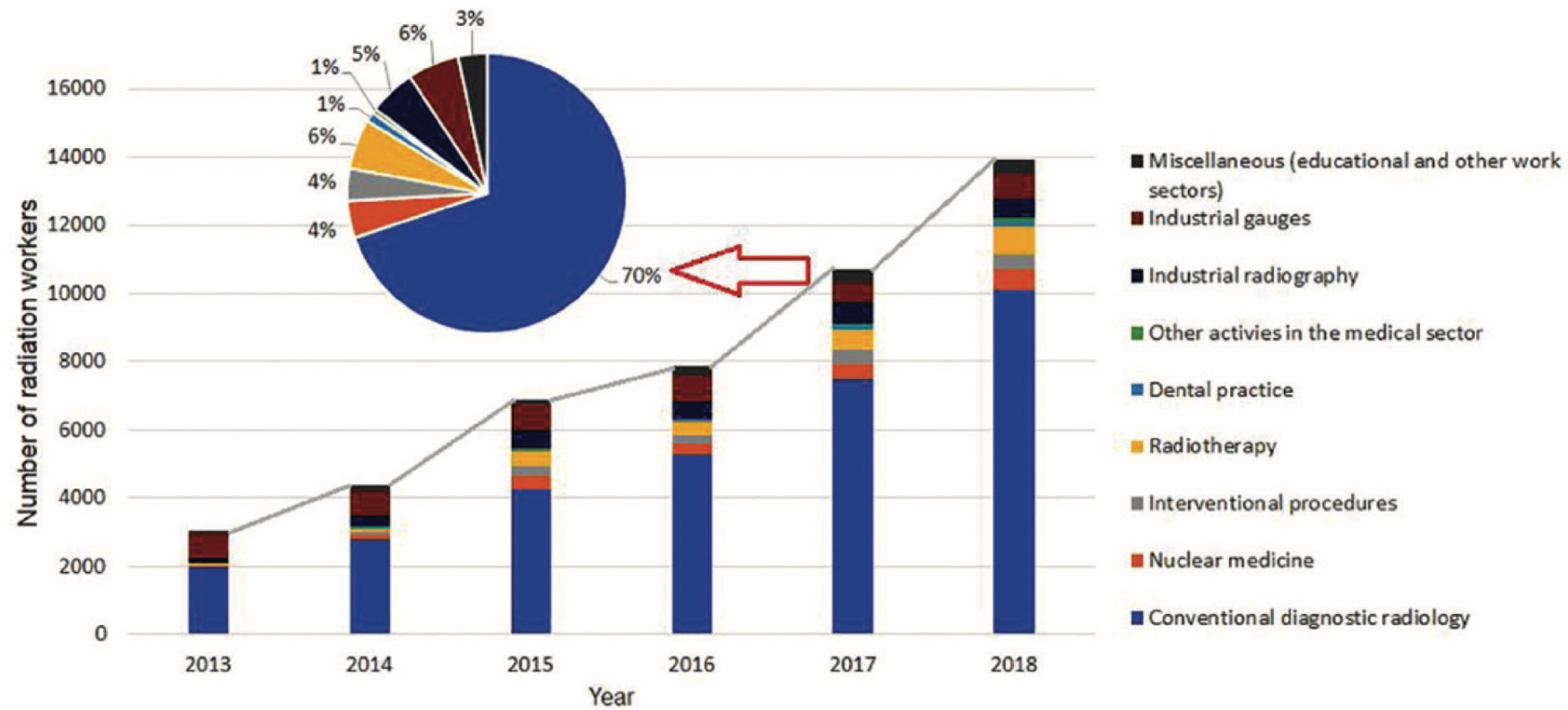


Figure 5. Total number of radiation workers individually monitored in 2013–2018 by PNRI-OSL and PNRI-TLD.



OTHER FEATURES (3)

Readily provides occupational dose
EXPOSURE PROFILES for risk assessment and
 part of commitment to UNSCEAR

<https://services.pnri.dost.gov.ph/registry/>

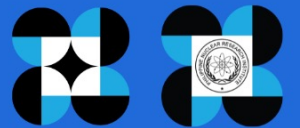


Table 1. Average and maximum annual occupational doses (in mSv) received by workers from according to type of practices.

Radiation practice		Annual dose received (mSv)					
		2013	2014	2015	2016	2017	2018
Nuclear medicine (NM)	Ave.	0.16	0.37	0.40	0.33	0.54	0.85
	Max	1.00	4.12	28.63	4.50	13.97	149
Conventional diagnostic radiology (CR)	Ave.	0.14	0.29	0.10	0.12	0.16	0.12
	Max	33.60	167.25	22.33	43.44	46.85	51.12
Interventional procedures (SC)	Ave.	0.07	0.78	0.25	0.27	0.36	0.17
	Max	0.37	24.96	24.47	21.03	8.35	9.48
Radiotherapy (RT)	Ave.	0.03	0.06	0.12	0.12	0.10	0.12
	Max	0.17	0.78	18.04	7.08	12.45	13.94
Dental practice (DP)	Ave.	0.02	0.03	0.05	0.07	0.07	0.30
	Max	0.10	0.19	0.46	0.69	1.52	14
Industrial radiography (IR)	Ave.	0.72	0.93	0.83	1.47	1.58	0.62
	Max	6.18	71.08	30.79	319.58	380.79	32.67
Industrial gauges (IG)	Ave.	0.11	0.17	0.33	0.09	0.08	0.07
	Max	14.16	33.52	101.25	23.93	3.06	19.03
Miscellaneous (educational, research, and manufacturing purposes)	Ave.	0.08	0.13	0.34	0.42	0.29	0.24
	Max	1.30	2.35	6.77	18.86	5.48	8.59



OTHER FEATURES (3)

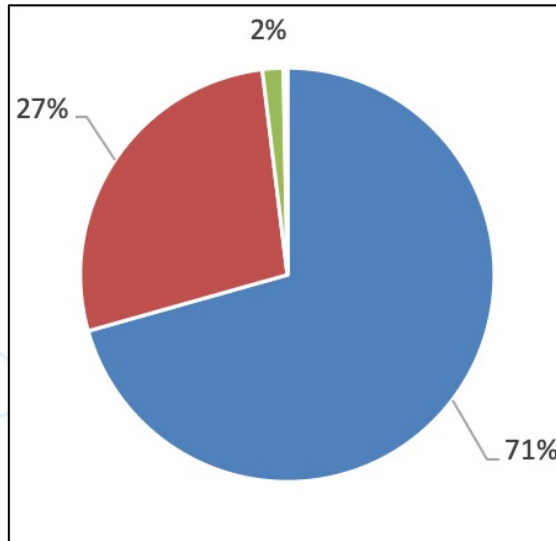
Readily provides occupational dose
EXPOSURE PROFILES for risk assessment and
part of commitment to UNSCEAR

<https://services.pnri.dost.gov.ph/registry/>

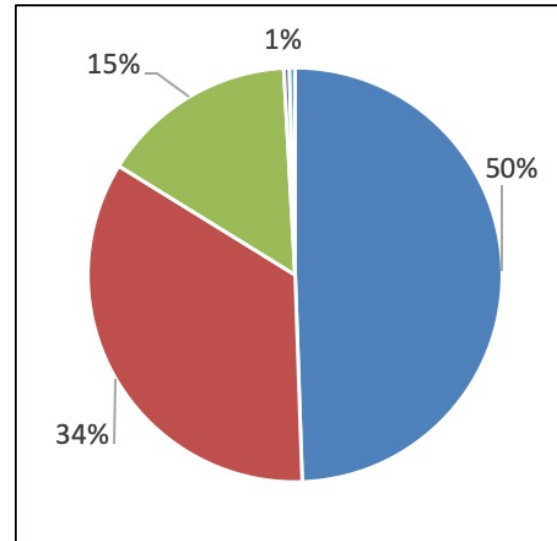


Dose range (mSv)

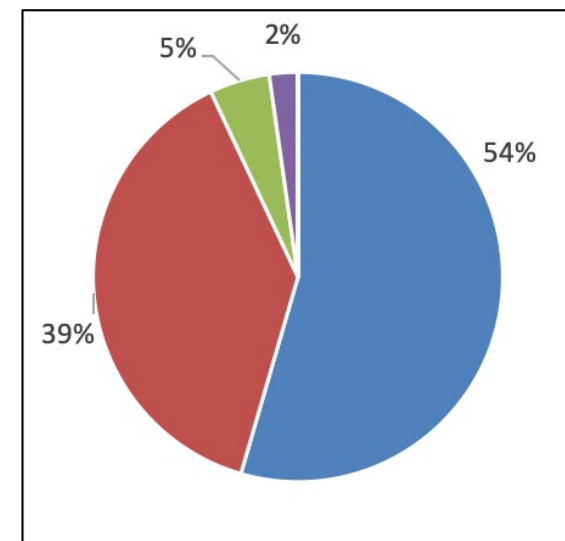
- < MDL
- MDL-1
- >1-5
- >5-10
- >10-15
- >15-20
- >20-30
- >30-50
- >50



Conventional radiology



Nuclear medicine



Interventional procedure



OTHER FEATURES (3)

Readily provides occupational dose
EXPOSURE PROFILES for risk assessment

<https://services.pnri.dost.gov.ph/registry/>



Summary

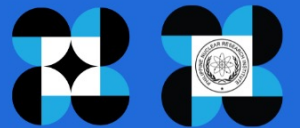
Philippines has no National Dose Registry yet

There are requirements for dosimetry service providers, but no specific provisions in the legislation and regulations

There is a Joint MOA between the regulatory agencies for the establishment of NDR

There is an existing Dose Registry (PHILDOSE) starting in 2019, but current dose records are limited to workers monitored under the PNRI TSP. It was developed and currently maintained by PNRI

Although not yet the NDR, PHILDOSE could serve as such and is ready to accept data from other service providers.





Thank you!