



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

An IAEA Update: Collaboration and Cooperation with regional ALARA networks under ORPNET



H. Burçin Okyar
Occupational Radiation Protection Unit
Radiation Safety & Monitoring Section, NSRW

ORPNET- landing page



IAEA International Atomic Energy Agency

TOPICS SERVICES RESOURCES NEWS & EVENTS ABOUT US

Home / Services / Networks / Occupational Radiation Protection Network (ORPNET)

Occupational Radiation Protection Networks (ORPNET)

The Occupational Radiation Protection Networks (ORPNET) promote the optimisation of occupational radiation protection. They provide comprehensive information about worldwide, regional, and national networks and systems related to the radiation protection of workers, while also enabling participating networks to cooperate with each other. They also feature information about upcoming meetings, new publications, joint projects, posters, and other related news.

Register for ORPNET

Access ORPNET collaboration platform

Resources

- Training
- ORPAS
- Conference Materials
- Events and Meetings
- Webinars, Posters and Leaflets
- Newsletters

Related resources

- Conference Proceedings from the International Conference on Occupational Radiation Protection 5-9 September 2022
- International Conference on Occupational Radiation Protection: Enhancing the Protection of Workers – Gaps, Challenges and Developments, 1-5 December 2014
- International Conference on Occupational Radiation Protection: Protecting Workers Against Exposure to Ionizing Radiation, 26-30 August 2002
- Networks
- Occupational radiation protection call for action
- Radiation protection
- Webinars in occupational radiation protection

Contact

- Send an email

National Arrangements on Occupational Radiation Protection

National regulations are composed of the necessary legal, administrative, and organisational arrangements that are necessary for controlling, monitoring, and recording the exposure of workers to radiation. They are similar or identical across different Member States. [Read more](#)

Workers and Radiation at Workplaces

The use of radiation in the workplace is a normal and required part of many occupations. [Read more](#)

Worldwide Networks

Enhancing safety standards for workers across a range of industries requires engagement at the global level to promote a harmonised approach to occupational radiation protection. [Read more](#)

Regional Networks

Through the local exchange of information on operations, the IAEA encourages the creation of regional networks to spread good practices on the application of optimisation via graded approach. [Read more](#)

Stationary

<https://www.iaea.org/services/networks/orpnet>

ORPNET What is ORPNET? Worldwide Networks Regional Networks Additional Resources Training

Home

Collaboration Platform

News

ENA webinar: Derivation of nuclide-specific surface-clearance levels for the normal reuse of objects leaving the controlled area of a nuclear facility

In the aftermath of the Fukushima nuclear accident, the Dutch National Institute for Public Health and the Environment (RIVM) developed a new methodology to assess the radiological consequences of surface contamination from surface contamination of imported non-food (consumer) goods, containers and conveyances from the area affected by the accident. SUDOQU distinguishes itself from other dosimetric models for surface contamination.

The webinar will take place on **November 21 at 12:00 (CET)** [Add to calendar >>](#)

EURADOS webinar: The European intercomparison of in-vivo monitoring laboratories (EIVIC-2020 project)

This webinar will discuss the outcomes of the EIVIC-2020 project, the objective of which was 'to assess the implementation of the individual monitoring requirements of the Basic Safety Standards (BSS) Directive in EU Member States (European Radiation Dosimetry Group). The webinar will take place on **4 December 2023 at 13:30 (GMT)**.

[Register >>](#)

New EURADOS Report 2023-02 on Individual Exposure and Monitoring in Interventional Radiology and Cardiology

The aim of the latest EURADOS report is to summarize the technical and legal aspects of individual monitoring requirements in interventional radiology and cardiology workplaces, incorporating some of the most recent developments in the field. The report is aimed at all those working in dose monitoring in the interventional field such as radiation protection experts, radiation protection officers, medical physicists, dosimetry services and other relevant stakeholders.

[Download report](#)

IAEA's ISEMIR-IR Global Survey and 2022 ISEMIR-R Annual Report are published

The 3rd ISEMIR-IR Global Survey Report and the 2022 ISEMIR-IR Annual Report are now available. The documents compile and report results of the survey conducted on regulators and non-destructive testing (NDT) service providers, providing information to the operators involved in industrial radiography (IR) and promote the use of the ISEMIR-IR system in the Member States. ISEMIR-IR is a web-based system developed by the IAEA to help IR facilities optimize their radiation protection.

Find the [3rd ISEMIR-IR Global Survey Report here](#) [Access the 2022 ISEMIR-IR Annual Report here](#) [Read more about ISEMIR-R here](#)

21st EURADOS Webinar: Computational support for Retrospective Dosimetry

The 2019 EURADOS-RENEB field test applied computational dosimetry using Monte Carlo radiation transport simulations. The test aimed to contribute to the development of computational dosimetry for retrospective dosimetry. The methods, results, and implications of the computational dosimetry analyses will be presented by researchers in a webinar on **September 26 at 10:00 CEST**.

[Registration](#)

Dynamic

<https://nucleus.iaea.org/sites/orpnet/home/SitePages/Home.aspx>

National Arrangements on Occupational Radiation Protection



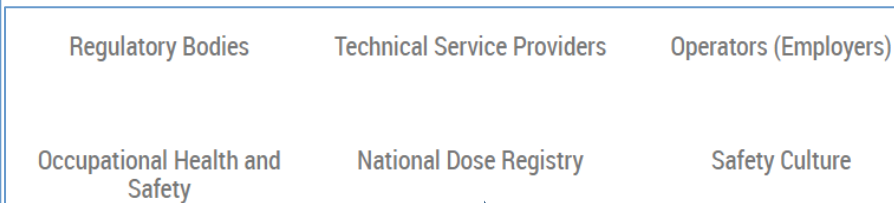
National regulations are composed of the necessary legal, administrative, and organisational arrangements that are necessary for controlling, monitoring, and recording the exposure of workers to radiation. They are similar or identical across different Member States. [Read more →](#)

Workers and Radiation at Workplaces

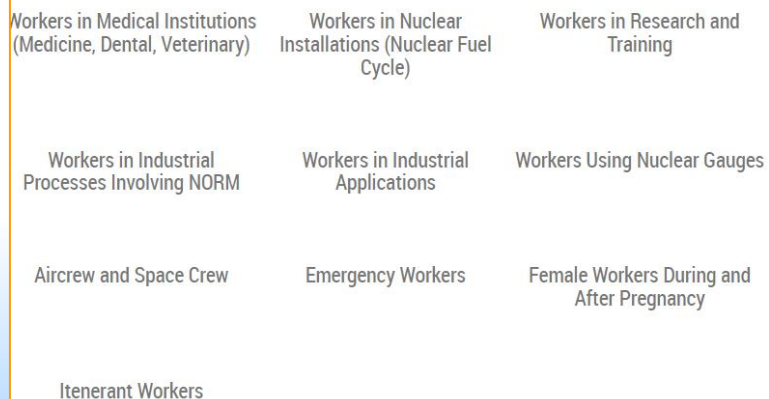


The use of radiation in the workplace is a normal and required part of many occupations. [Read more →](#)

ORPNET- pages



Workers and Radiation at Workplaces



State/National Dose Registry

The typical National Dose Registry (NDR) contains the dose records of individuals who are monitored for occupational exposures to ionizing radiation.

What do I need to know?

Individual monitoring of workers exposed to radiation as a part of their job and recording their radiation doses are important parts of national occupational radiation protection programmes. The IAEA General Safety Requirements on *Governmental, Legal and Regulatory Framework for Safety* (No. GSR Part 1 (Rev.1)) and *Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards* (No. GSR Part 3) describe the specific characteristics of such programmes. GSR Part 3 includes requirements for the retention of workers' occupational exposure records by the regulatory body or a State registry, or by a relevant employer, registrant, or licensee.

National Dose Registries enable the optimization of protection and help ensure compliance with the dose limits at the national level. The IAEA General Safety Guide *Occupational Radiation Protection* (No. GSG-7) notes that a typical registry contains personal, employment and dosimetric data for all occupationally exposed workers in the country.

Characteristics of a typical NDR

Consideration should be given to the establishment of a national dose registry as a central point for the collection and maintenance of dose records. The storage of information at the National Dose Registry should be tailored to allow workers, during and after their working life, to retrieve information on the doses they received while occupationally exposed.

Long term storage of such information in a NDR also serves the following purposes:

1. It prevents the loss of data on individual doses in the event that the registrant or licensee ceases its activities in the State concerned.
2. It allows periodic analysis of all data collected on exposures in order to characterize the situation at the national level with regard to occupational exposure.

References

- *Fundamental Safety Principles*, IAEA Safety Stanards Series No. SF-1, IAEA, Vienna (2006)
- *Radiation Protection and Safety of Radiation Sources: International*

Home / Services / Networks / Occupational Radiation Protection Networks (ORPNET) / Workers and Radiation at Workplaces

Workers in Industrial Processes Involving NORM

Occupational Radiation Protection Networks (ORPNET)

- National Arrangements on Occupational Radiation Protection
- Workers and Radiation at Workplaces
 - Workers in Medical Institutions (Medicine, Dental, Veterinary)
 - Workers in Nuclear Installations (Nuclear Fuel Cycle)
 - Workers in Research and Training
 - Workers in Industrial Processes Involving NORM
 - Workers in Industrial Applications
 - Workers Using Nuclear Gauges
 - Internal Dosimetry
 - Optimization
 - Aircrew and Space Crew
 - Emergency Workers
 - Female Workers During and After Pregnancy
 - Itinerant Workers
- Worldwide Networks
- Regional Networks
- ORPNET Training material

Natural resources that are extracted from the ground such as coal, oil, natural gas and other mineral ores contain various amounts of natural radioactivity. When these resources are extracted and processed, their natural state can be modified which may result in the enhancement of the natural radioactivity content originally present. Such enhancements may be observed in the residues or the waste created and/or in the products or by-products and are sometimes high enough to pose a risk to workers if they are not controlled properly. Materials of this kind are commonly referred to as **Naturally Occurring Radioactive Material or NORM**.

What are the examples of activities associated with NORM?

The following industrial activities associated with NORM are, or may be, subject to Regulations:

- Mining and processing of uranium ore.
- Extraction of rare earth elements.
- Production and use of thorium and its compounds.
- Production of niobium and ferro-niobium.
- Mining of ores other than uranium ore.
- Production of oil and gas.
- Manufacture of titanium dioxide pigments.
- Activities in the phosphate industry.
- Activities in the zircon and zirconia industries.
- Production of tin, copper, aluminium, zinc, lead, and iron and steel.
- Combustion of coal.
- Water treatment.

What do I need to know?

Workers involved in the industrial processes involving NORM are occupationally exposed to radiation. Not all industrial processes produce NORM. The volumes and concentrations of NORM vary according to the natural abundance of radionuclides in the materials that are employed or treated. Current exposures to NORM in industrial processes are low; however regulations, controls and monitoring are required to optimize the radiation exposures.

According to the GSR Part 3, occupational exposure due to natural sources is, in general, subject to the requirements for existing exposure situations. In the case of occupational exposure due to radionuclides of natural origin in materials other than these everyday commodities and due to radionuclides in residues in the environment, the applicable requirements depend on the radionuclide activity concentrations, as follows:

- If in any process material, the activity concentration of any radionuclide in the ^{238}U decay series or the ^{232}Th decay series exceeds 1 Bq/g, or if the activity concentration of ^{40}K exceeds 10 Bq/g, the industrial activity is regarded as a practice and the requirements for planned exposure situations apply.
- If in every process material, the activity concentrations of all radionuclides in the ^{238}U decay series and the ^{232}Th decay series are 1 Bq/g or less and the activity concentration of ^{40}K is 10 Bq/g or less, the material is not regarded as naturally occurring radioactive material; the industrial activity is not regarded as a practice and the

Pages: Worldwide & Regional Networks

Worldwide Networks



Enhancing safety standards for workers across a range of industries requires engagement at the global level to promote a harmonised approach to occupational radiation protection.

[Read more →](#)

Worldwide Networks

Information System on Uranium Mining Exposures



Information System on Occupational Exposure in Medicine, Industry and Research (ISEMIR)



Information System on Occupational Exposure (ISOE)



Regional Networks



Through the local exchange of information on operations, the IAEA encourages the creation of regional networks to spread good practices on the application of optimisation via graded approach.

[Read more →](#)

Regional Networks

African Alara Network (AFAN)	Asian Radiation Dosimetry Group (ARADOS)	Asian Network of Cardiologists in Radiation Protection
Asian Nuclear Safety Network (ANSN)	Asia and Pacific Regional ALARA Network (ARAN)	Coordination of Regional Networks (CoRPAN)
European ALARA Network (EAN)	European NORM Association (ENA)	European Medical ALARA Network (EMAN)
European Radiation Protection Authorities Network (ERPAN)	European Platform for Occupational Radiation Exposure (ESOREX)	European Radiation Dosimetry Group (EURADOS)
European Training and Education in Radiation Protection Platform (EUTERP)	OTHEA/RELIR	Latin America Occupational Radiation Protection Optimization Network (REPROLAM)

Other features

News



21 November 2023

Botswana is Committed to Radiation Protection of Workers, says IAEA



14 November 2022

ORPAS Follow-Up Mission to UAE Marks Strong Country Commitment to Radiation Protection of Workers, Including Space Crews



25 October 2022

ORPAS Mission to Philippines Highlights Efforts to Enhance Radiation Protection of Workers



13 September 2022

Tailored Approaches Key to Optimizing Occupational Radiation Protection

Publications



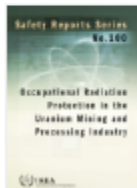
14 November 2023

Application of the Concept of Exemption



9 November 2023

Neutron Monitoring for Radiation Protection



7 April 2020

Occupational Radiation Protection in the Uranium Mining and Processing Industry



12 October 2018

Radiation Protection and Safety in Medical Uses of Ionizing Radiation

[More publications →](#)

Register for

ORPNET

Access

ORPNET
collaboration platform

Resources

Training

ORPAS

Conference Materials

Events and Meetings

Webinars, Posters and Leaflets

Newsletters

Related resources

- Conference Proceedings from the International Conference on Occupational Radiation Protection 5-9 September 2022
- International Conference on Occupational Radiation Protection: Enhancing the Protection of Workers – Gaps, Challenges and Developments, 1-5 December 2014
- International Conference on Occupational Radiation Protection - Protecting Workers Against Exposure to Ionizing Radiation, 26-30 August 2002
- Networks
- Occupational radiation protection call for action
- Radiation protection
- Webinars in occupational radiation protection

Occupational Radiation Protection Action Plan



- The first International Conference on Occupational Radiation Protection (2002) hosted by the Government of Switzerland, held in Geneva
 - Findings & recommendations: http://www-ns.iaea.org/downloads/rw/meetings/geneva_conf.pdf
- September 2002, IAEA General Conference, request for the IAEA's Director General, in co-operation with the ILO and other relevant bodies, to formulate and implement an Action Plan
- Action Plan for Occupational Radiation Protection
<http://www-ns.iaea.org/downloads/rw/ppss/action-plan-orp2003.pdf>
 - Steering Committee with the overall remit to advise on, monitor, and assist in the practical implementation of the Action Plan
- Participants: Representatives of a number of interested MSs and interested IOs including employers' and workers' organizations

2003 Actions

- Actions for strengthening ORP worldwide are grouped according to nine areas that provide a logical division of tasks to be carried out:
 - Promoting and servicing the Radiation Protection Convention, 1960 (No. 115)
 - Co-operation between the IAEA and ILO in reaching developing countries
 - Establishment of occupational **safety standards** and development of supporting
 - Support for strengthening **regulatory infrastructures**
 - **Peer review missions** to appraise occupational radiation protection
 - **Intercomparisons** of monitoring methods for assessing occupational exposure
 - **Promotion of information exchange**
 - Exposure to **enhanced natural radiation in the workplace**
 - Promotion of a **holistic approach** to workplace safety
 - Formulation and application of standards for the protection of **pregnant workers and their embryos and fetuses**
 - **Education and training**

Action Plan for Occupational Radiation Protection

Prepared by the
International Atomic Energy Agency

In co-operation with the International Labour Office

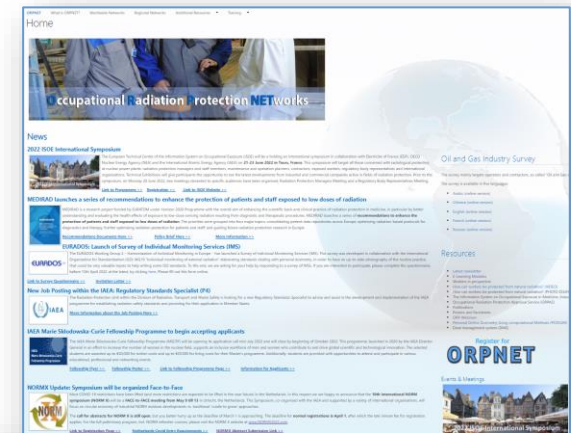
Result of the International Conference on Occupational Radiation Protection, held in Geneva,
Switzerland, 26-30 August 2002



Approved by the IAEA Board of Governors on 8 September 2003

Initiation – web site

- As an outcome of the IAEA/ILO International Action Plan on Occupational Exposure, **the Occupational Radiation Protection Networks website** has been established in 2010 as a shared platform providing perspective for improving occupational radiation protection worldwide
- Development and progress of ORPNET was discussed during the International and Regional ALARA Networks Coordination Meetings, which were organized by the IAEA in 2012 and 2014 and contributed by the representatives of international and regional networks

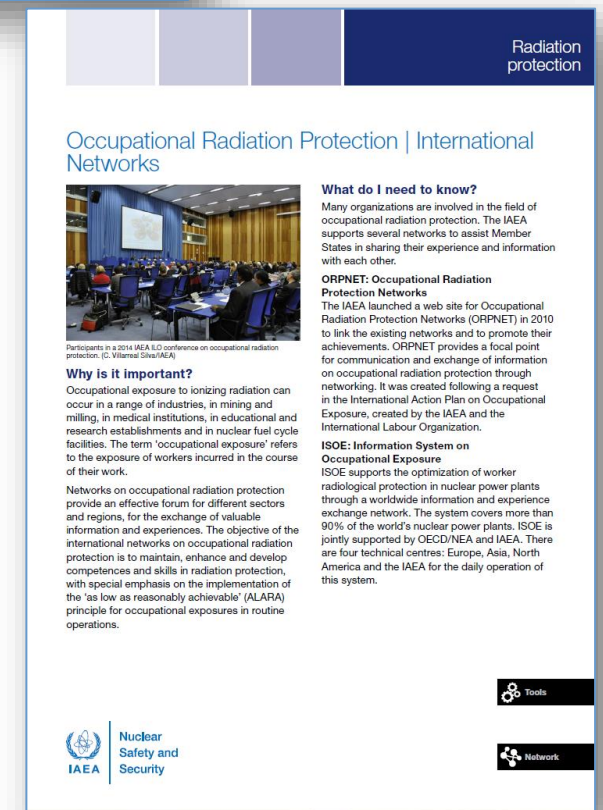
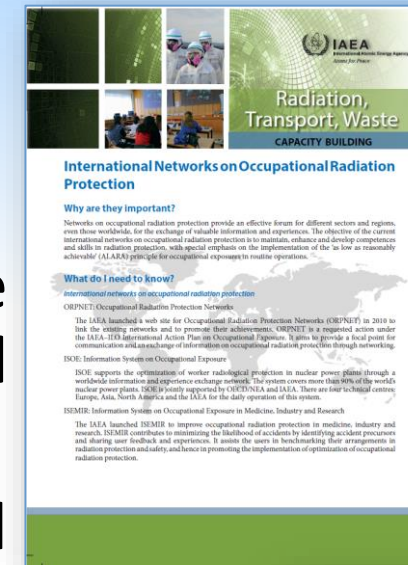


Establishing ORPNET motto:
Networking : an efficient tool for the implementation of the
Safety Standards



ORPNET, in principal

- ORPNET is a web-based network with an ultimate goal to **promote optimization of the occupational radiation protection**.
- It acts as a **focal point** for the occupational radiation protection providing:
 - comprehensive knowledge about worldwide
 - regional and national networks and systems for radiation protection of workers
 - ORPNET spreads good practices, facilitates ALARA (optimization) implementation, supports experience exchange, and aims to prevent any overlap of activities at the national and international level



ORPU / ORPNET- New



IAEA launches new online training course in occupational radiation protection



The IAEA has released new training material on occupational radiation protection. The material is based on GSG-7, which provides general guidance on the development of occupational radiation protection programmes in accordance with the requirements of GSR Part 3, and addresses the sources of radiation likely to be encountered in workplaces.

The course is publicly available in English within the IAEA's learning management system.

[View the course >>](#)



Occupational Radiation Protection based on General Safety Guide No. GSG-7

The purpose of this course is to increase understanding of the occupational exposure control requirements contained in GSR Part 3 and how these safety standards fit within the IAEA Safety Standards hierarchy. Participants will learn how to fulfil the requirements of GSR Part 3 with respect to occupational exposure and GSG-7 recommendations relating to planned, existing and emergency exposure situations for occupational exposure.

The course contains 10 modules and covers:

- Framework for occupational radiation protection;
- Exposure of workers in different exposure situations;
- Monitoring and recording;
- Assessment of occupational exposures;
- Management system for service providers;
- Occupational exposure control measures;
- Protection of workers in special cases
- Workers' health surveillance.

This e-learning course was funded under the IAEA Regional Technical-Co-operation Project on Enhancing National Capabilities on Occupational Radiation Protection in Compliance with Requirements of the International Basic Safety Standards (RAS/9/080).

[Click to enter this course](#)

<https://elearning.iaea.org/m2/>

Occupational Radiation Protection

- ➔ [Occupational Radiation Protection based on General Safety Guide No. GSG-7](#)
- ➔ [Occupational Radiation Protection Appraisal Service \(ORPAS\)](#)
- ➔ [Management and Control of Naturally Occurring Radioactive Material \(NORM\)](#)
- ➔ [Radiation Protection Training Course for Occupationally Exposed Workers](#)

Occupational Radiation Protection Appraisal Service (ORPAS)



Occupational
Radiation Protection
Appraisal Service

ORPAS

Occupational Radiation Protection Appraisal Service (ORPAS) is a peer review service provided by the IAEA, the objective of ORPAS is to enhance national arrangements for radiation protection of workers in Member States.

The ORPAS Guideline was published in 2020 based on the IAEA | Safety Standards as well as the lessons learned from past missions and on contributions and comments provided by Member States. A training package was developed based on the ORPAS Guideline. The e-learning on ORPAS is developed by using the training package on the topic.

The purpose of the e-learning is to provide ORPAS reviewers and stakeholders a training on ORPAS including introduction, procedures, report drafting and necessary knowledge to conduct an ORPAS mission.

This course covers all phases of an ORPAS mission and contains 5 modules:

1. Introduction to ORPAS
2. Mission Preparation
3. ORPAS Mission
4. ORPAS Final Report
5. Post-mission Activities

The whole course is in **English** and **self-paced**. In order to receive the Certificate of Completion, all assessments need to be passed with a **minimum score of 80%**.

The estimated duration is **4 hours**.

ORPNET – house for global surveys



Occupational Radiation Protection NETWORKS

News

IAEA questionnaires on occupational exposures to NORM in the water supply and treatment industry



The Information System on Occupational Exposure in Medicine, Industry and Research has been developed by the International Atomic Energy Agency (IAEA) to enable the assessment of the impact of various radiation protection actions in different facilities and activities and forms a database containing detailed information on operational occupational doses for comparison and benchmarking of doses for specific occupations, functions and tasks and has been extended for industrial processes involving naturally occurring radioactive material (ISEMIR-N).

In response to the IAEA General Conference Resolution GC(64)/RES/9, requesting the Secretariat to strengthen their capabilities for the realistic assessment of radiological impacts of material containing enhanced levels of NORM, the IAEA has launched a global survey specific to the water supply and treatment industry as a part of ISEMIR-N.

The questionnaires are available for download in six languages and should be completed and returned by email to ISEMIR-N.Contact-Point@iaea.org. Online versions are available in English for [operators](#) and [regulatory bodies](#). Deadline: **15 March 2021**.

NORM questionnaires

IAEA global questionnaire on occupational exposures to NORM in the water supply and treatment industry. All operators and regulatory bodies are invited to submit their information by 15 March 2021.

Questionnaire for operators to download:

[Arabic](#)
[Chinese](#)
[English \(online version\)](#)
[French](#)
[Russian](#)
[Spanish](#)

Questionnaire for regulatory bodies to download:

[Letter to Head of Regulatory Authority >>](#)
[Arabic](#)
[Chinese](#)
[English \(online version\)](#)
[French](#)
[Russian](#)
[Spanish](#)

News — December 2023



ORPNET wishes you a Happy Holiday Season

The IAEA's Occupational Radiation Protection Networks (ORPNET) wishes you a happy holiday season and a successful year in 2024.



Occupational Radiation Protection Call for Action

As an important follow up, the third International Conference on Occupational Radiation Protection identified nine actions to enhance the protection of workers.

[Read here](#)



New IAEA reports on Fukushima Daiichi ALPS treated water

Read the latest IAEA reviews on the Safety Related Aspects of Handling ALPS Treated Water at TEPCO's Fukushima Daiichi Nuclear Power Station.

[Read more](#)



IAEA conducts first ORPAS mission to Botswana

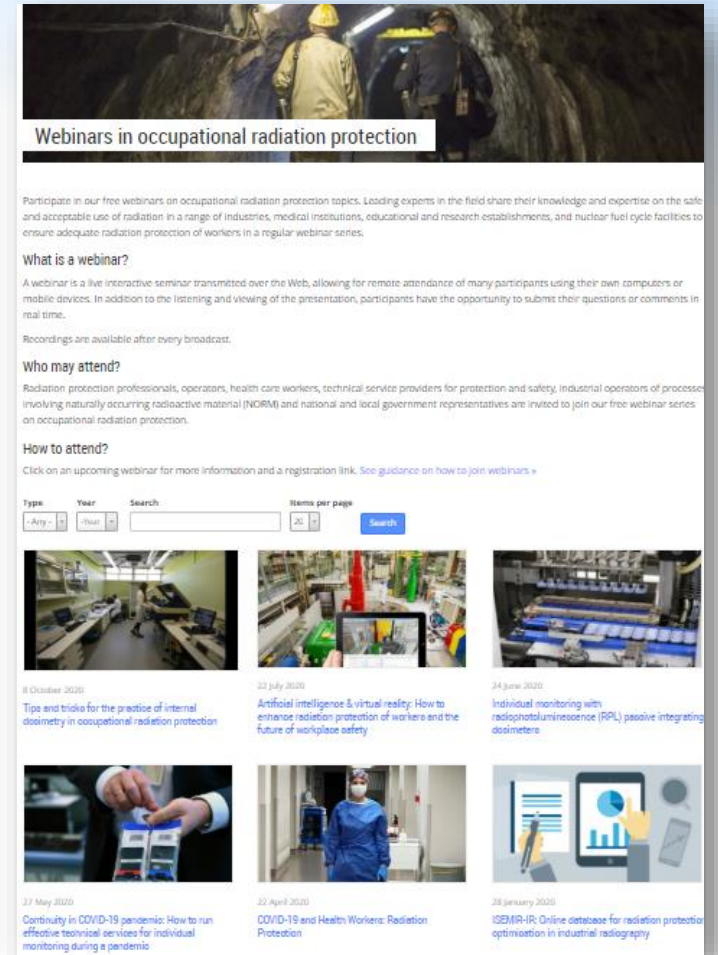
The first Occupational Radiation Protection Service (ORPAS) mission to Botswana highlighted that the country has a good management system for radiation protection.

[Read more](#)

Newsletter

ORP Webinars

- Family member of RSM/NSRW Radiation Protection Webinars
 - Radiation Protection of the Public
 - Radiation Protection of Patients
 - **Radiation Protection of Workers**
- ORP Webinars
 - RP professionals, regulators, employers, operators, workers, worker representatives, qualified experts, licensees/registrants, technical service providers for protection and safety, industrial operators of processes involving NORM & national and local government representatives



<https://www.iaea.org/topics/radiation-safety/webinars>



- **Surveys to identify installed capacities** in the Latin American and Caribbean región

- Computational Dosimetry
- Internal Dosimetry
- Retrospective Dosimetry
- Biological Dosimetry

Interaction with SEPR and EURADOS

International events

- International Conference on Occupational Radiation Protection: Strengthening Radiation Protection of Workers –Twenty Years of Progress and the Way Forward 5 – 9 September 2022- Ginebra
- VI- International Join Conference RADIO 2022 – Poços de Caldas, Brazil, August 15 to 19, 2022
- XII Regional Congress of Radiological and Nuclear Safety and X IRPA Regional Congress October 23 to 27, 2022, Santiago, Chile

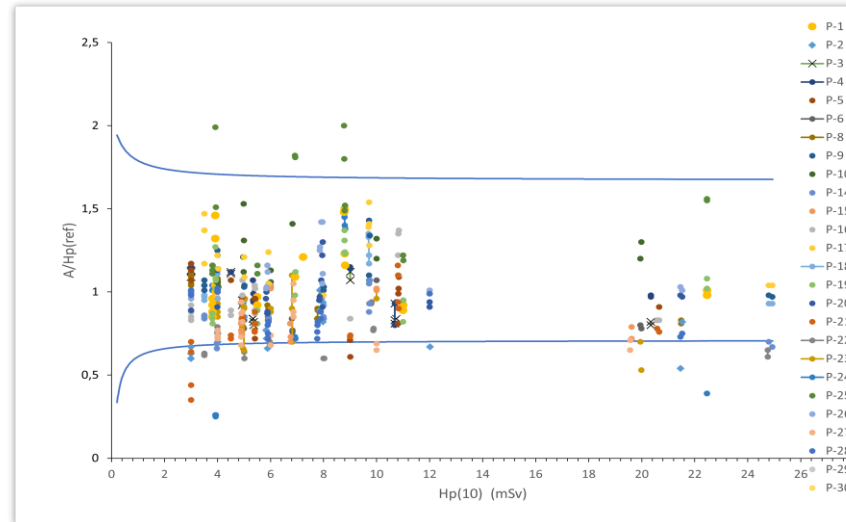
REPROLAM & IC exercises

ICREPROLAM2022 - INTERCOMPARACIÓN DE REPROLAM PARA SERVICIOS DE DOSIMETRÍA
EXTERNA DE CUERPO ENTERO

Publicado en Web de REPROLAM: 03/06/2022

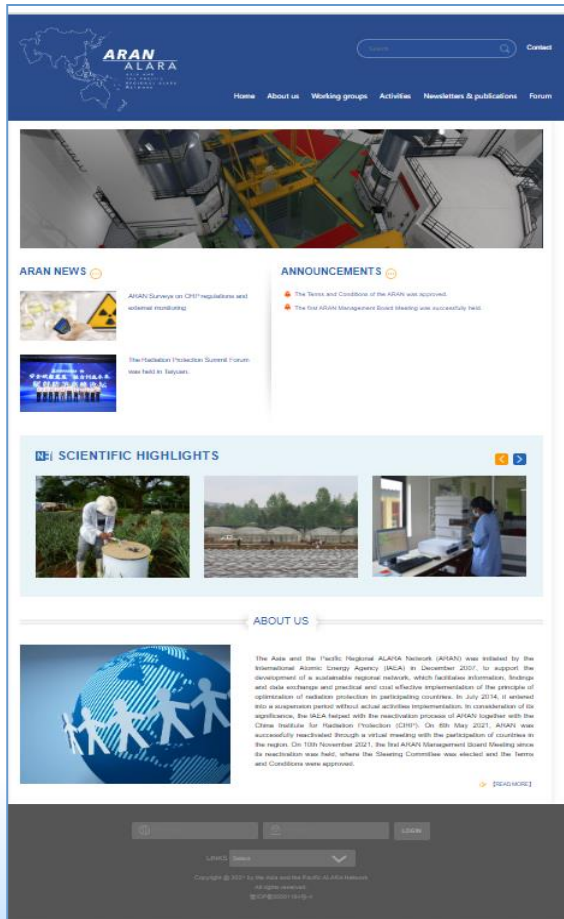


- Number of personal dosimetry services that participated in the ICReprolam 2022 Intercomparison of whole-body $H_p(10)$ and $H_p(0.07)$.
- 26 services: 10 private and 16 public



- 7.7% (two) services overestimate $H_p(10)$ doses
- 38.4% (ten) services underestimate the $H_p(10)$ dose

- In 2023, intercomparison exercises:
 - Internal Dosimetry
 - Dosimetry of the lens of the eyes and extremities
 - Calibration of area monitors and surface contamination monitors



- Operated until July 2014 and entered into a transition period. Since then, the ARAN has not been working, except an attempt in 2017 with an IAEA regional workshop.
- In 2021, the Virtual Management Board Meeting of ARAN was organized by China Institute for Radiation Protection (CIRP) in collaboration with the IAEA, TOR, Steering Committee, WGs and 21 country representatives as management board members.
 - Australia, Bahrain, Bangladesh, China, Indonesia, Iraq, The Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Malaysia, Nepal, Oman, Pakistan, Philippines, Republic of Korea, Sri Lanka, Syria, T.T.U.T.J of T. Palestinian A., Thailand, and Qatar.



NO.	Name
WG1	Dose Assessment
WG2	Medical Applications
WG3	Industrial Sources and Practices
WG4	Natural Radiation Sources
WG5	Emergency Preparedness and Response
WG6	Education and Training

- **Rapid development of nuclear energy**
 - The Asia Pacific region has become the most growth vitality and development potential region in the world, with a vast territory and a large population.
 - Almost 70% of the nuclear reactors under construction is in Asia-Pacific region
- **Huge gap in the scale of nuclear application among Asia-Pacific countries**
 - In some countries, the activities cover many fields such as uranium mining, nuclear power plants, industry irradiation, medical and agriculture, while in some countries, activities are limited.
 - There is also a large difference in the number of medical equipments. For example, there is an almost 400-fold difference in the number of CT scanners relative to the population between the highest and lowest countries.
- **Great potential development space for number of occupational workers**
 - Noticing that the ratio of number of occupational workers to nation's population is 10-, even 100- times lower than that of developed countries (from man-made sources, mainly medical application) .
- **Big diversity in the infrastructure and technical capacity of ALARA in different countries.**
 - Some countries have established complete radiation protection laws, regulations and management systems, while some countries have just begun to formulate radiation safety legal frameworks with the help of IAEA TC projects.
 - Some countries have accumulated a considerable number of good ALARA practices and developed several advanced ALARA tools, while in some countries, external exposure dose monitoring cannot cover all radiation workers, and the internal exposure dose monitoring has not yet started.

IC Exercise





60 Years
IAEA
Atoms for Peace and Development

RAS/9/080 REGIONAL PROJECT
Enhancing National Capabilities on Occupational Radiation Protection in Compliance with Requirements of the New International Basic Safety Standards

ANNOUNCEMENT

JOINT IAEA / ARPANSA REGIONAL INTERCOMPARISON EXERCISE
ON INDIVIDUAL MONITORING FOR EXTERNAL EXPOSURE
2018

Introduction

The purpose of regional TC project RAS/9/080 is to strengthen national capacities for occupational radiation protection in compliance with International Basic Safety Standards. This is formulated through the promotion of self-assessment tools, including harmonization and implementation of the relevant International Safety Standards for improved provisions for dosimetry, workplace monitoring and harmonized capacity in the region.

Improvement of the quality management system in the individual monitoring service laboratory in the region is still a challenge. Systematic training for the staff in the laboratory and inter-comparison exercise on individual monitoring is indispensable. Therefore RAS/9/080 is supporting for an inter-comparison exercise for participating Member States in Asia and the Pacific region to support the improvement of QMS of the laboratories in the region.

The aim of this inter-comparison (IC) exercises is to assess the capabilities of the dosimetry services in the region to measure the quantity Hp(10) in photon (gamma and X ray) fields, thus supporting participating Member States (MSs) to achieve a more accurate dosimetry service. An additional objective is to provide MSs with guidelines to improve the performance of the existing dosimetry services in line with the project milestones of RAS/9/080 project. The IC exercise is open to 30 (thirty) individual monitoring service (IMS) laboratories of MSs participating in the TCAP programme.

Scope

The 2018 IC exercise for TLD, OSL, RPL and film these dosimeters (rest) Hp(10) and Hp(0.07) in

- Energy: 70 and 6
- Dose equivalent
- Angle of incidence



Australian Government
Australian Radiation Protection and Nuclear Safety Agency



Certificate of Participation

IN THE JOINT IAEA/ARPANSA REGIONAL INTERCOMPARISON EXERCISE
ON INDIVIDUAL MONITORING FOR EXTERNAL EXPOSURE – 2018 (RAS/9/080)

Issued in Melbourne, on 8 February 2019, to

Office of Atoms for Peace, Thailand

The Joint IAEA/ARPANSA Regional Intercomparison Exercise on Individual Monitoring for External Exposure was organized under the Asia and the Pacific Regional Cooperation Project (RAS/9/080). The aim of this exercise was to assess the capabilities of the dosimetry services in the region to measure personal dose equivalent, Hp(10), in photon fields (gamma and X-ray), thus supporting participating Member States to achieve a more accurate dosimetry service. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) collaborated with the IAEA to provide this Intercomparison Exercise. ARPANSA maintains the primary standards for the dosimetry of ionization radiation for Australia. ARPANSA's Calibration and Measurement Capabilities (CMC) and comparison results are listed in the BIPM Key Comparison Database.

The Intercomparison Exercise was conducted between July 2018 and February 2019.

Each participant was required to provide 25 dosimeters:

- Five dosimeters were used to measure irradiation during storage and transport (control dosimeters)
- Five dosimeters (numbered 1 – 5) were exposed to a ⁶⁰Co beam at an incident angle of 0°
- The personal dose equivalent delivered was 3.18 mSv, with a 95% confidence interval of ±0%
- Five dosimeters (numbered 6 – 10) were exposed to a ⁶⁰Co beam at an incident angle of 30°
- The personal dose equivalent delivered was 3.21 mSv, with a 95% confidence interval of ±0%
- Five dosimeters (numbered 11 – 15) were exposed to an X-ray beam at an incident angle of 0°
- The X-ray beam was supplied by a constant potential, tungsten target X-ray tube. The beam quality was 70 kVp, 15 mA with an additional 4 mm of aluminium filtration, producing an effective energy of 34 keV (DTP-1, 19 mm Al). This is similar to the radio TDTD PDB therapy beam.
- The personal dose equivalent delivered was 5.84 mSv, with a 95% confidence interval of ±0%
- Five dosimeters (numbered 16 – 20) were exposed to an X-ray beam at an incident angle of 30°
- These exposures were to the same beam quality as that used for the exposures at 0°
- The personal dose equivalent delivered was 5.34 mSv, with a 95% confidence interval of ±0%

The results measured by the participant were considered to be acceptable if

$$\frac{H_p}{H_{p,ref}} \left(1 - \frac{H_{p,ref}}{H_p} \right) \leq 1.5 \quad \text{for } H_p \leq 1.5 \cdot H_{p,ref} \quad \text{for } H_p/H_{p,ref}$$

where $H_{p,ref}$ is the lowest dose that needs to be measured, H_p is the dose to which the dosimeter was exposed and $H_{p,ref}$ is the dose measured by the participant. For the purposes of this exercise, $H_{p,ref}$ was set at 0.08 mSv.



Stephen Long
Assistant Director
Monitoring and Emergency Response Section
Radiation Health Services



Duncan Butler
Director
Primary Standards, Dosimetry Laboratory
Medical Radiation Services

Certificate 1 of 28



IAEA
International Atomic Energy Agency



中国辐射防护研究院
CHINA INSTITUTE FOR RADIATION PROTECTION

RAS/9/093 REGIONAL PROJECT
Strengthening Technical Services in Occupational Radiation Protection in Compliance with the New International Basic Safety Standards

ANNOUNCEMENT

JOINT IAEA / CIRP REGIONAL INTERCOMPARISON EXERCISE ON INDIVIDUAL MONITORING FOR EXTERNAL EXPOSURE
2024

Introduction

The purpose of the regional TC project RAS/9/093 is to strengthen the capabilities of technical service providers in occupational radiation protection in compliance with the requirements of Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards (GSR Part 3) and recommendation of the General Safety Guide on Occupational Radiation Protection (GSG-7) in Asia and the Pacific region. The Intercomparison (IC) exercise will be organized jointly by the International Atomic Energy Agency (IAEA) and China Institute for Radiation Protection (CIRP) in collaboration with the Asia and the Pacific ALARA Network (ARAN).

The IC exercise is one of the outputs of RAS/9/093 Regional Project for the harmonization of practices, exchange of knowledge on external dosimetry and achieve a common understanding among authorized or approved dosimetry service providers that operate under a quality management system.

The aim of the IC Exercise is to assess the capabilities of the technical dosimetry services in the region and improve the performance for Hp (10) and Hp (0.07) in photon (gamma and X ray) fields, thus supporting participating Member States (MSs) to achieve a more accurate dosimetry service in line with the project milestones of RAS/9/093 project.

IC Exercise will be directed by the Steering Committee and Secondary Standard Dosimetry Laboratories (SSDL) of Malaysia and Philippines will be the backup laboratories to carry out the necessary irradiation of dosimeters and the evaluation will be conducted according to the methodology described in ISO 13528:2022 Statistical Methods for Use in Proficiency Testing by Interlaboratory Comparison. The IC exercise is open to individual monitoring service (IMS) laboratories of MSs participating in the TCAP programme.

Scope

The 2024 IC Exercise will focus on external monitoring for Hp(10) and Hp(0.07) assessment, especially on passive dosimeters such as TLD, OSLD, and RPLD. The irradiation process will be carried out in terms of Hp (10) and Hp (0.07) for whole body and extremity dosimetry in the following ranges:

- Energy: 60 – 662 KeV
- Dose: 0.5 mSv – 10 mSv
- Angle of incidence: 0 – 30 degrees

Table 1. The schedule of activities for the intercomparison exercise

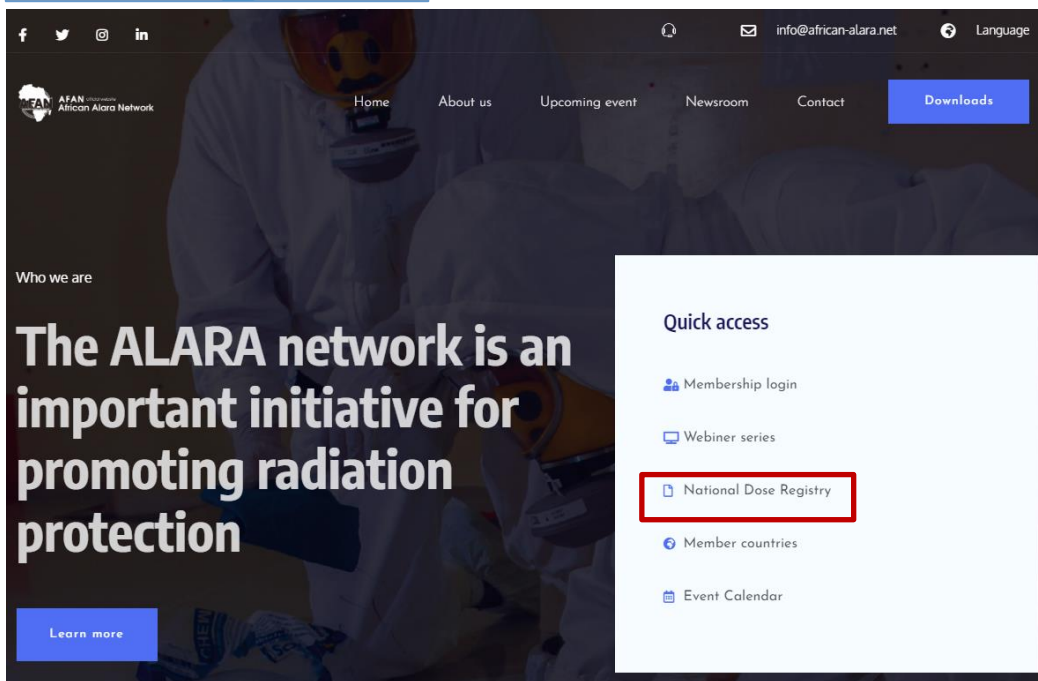
No	Agenda	Activities	Time Frame
1	Official announcement and confirmation of participation (Deadline 9 February 2024)	IAEA, CIRP and ARAN announce the Intercomparison Exercise	Announcement during the Coordination meeting (17-19 January 2024)
2	Sending the dosimeters to the Irradiation Laboratory (host Institute)	The participants sent the dosimeters to CIRP.	Dosimeters must arrive by 31 May 2024
3	Irradiation	CIRP irradiates the dosimeters	June 2024
4	Dosimeters sent back to participants' laboratories	The irradiated dosimeters will be sent back to the participating laboratories for reading and evaluation	28 June 2024
5	Reading / Evaluating the dosimeters	Participants report the result of the evaluation	July- August 2024
6	Reporting the Intercomparison results	Participants shall report the results	Participants must report by 2 September 2024
7	Evaluate the participants reports	The Steering Committee evaluate the participants' reports	October 2024
8	Evaluation Workshop & Finalization of IC Exercise Report	Discussion of finding results and preparation of joint report	4-6 November 2024 Kuwait (provisional)

Table 2: Irradiation plan: Information about the type of radiation, radiation quality, mean photon energy, dose range and the number of dosimeters required for the Whole Body Dose, Hp (10). Irradiation qualities are reported according to ISO 4037 and IEC 61267

Radiation	Quality	Mean photon / Max beta energy (keV)	Dose range Hp (10) mSv	Number of dosimeters
Gamma	S-Cs/0°	662	0.5 – 10.0	2
	S-Cs/30°	662	0.5 – 10.0	2
X-Ray	N-200/0°	164	0.5 – 10.0	2
	N-200/30°	164	0.5 – 10.0	2
	N-150/0°	118	0.5 – 10.0	2
	N-80/0°	65	0.5 – 10.0	2
Control dosimeters	NA	NA	NA	2

Table 3: Information about the type of radiation, radiation quality, mean photon energy, dose range and the number of dosimeters required for the Extremity Dose, Hp (0.07). Irradiation qualities are reported according to ISO 4037 and IEC 61267

Radiation	Quality	Mean photon / Max beta energy (keV)	Dose range Hp (0.07) mSv	Number of dosimeters
X-Ray	N-80/0°	65	0.5 – 10.0	2
	N-100/0°	83	0.5 – 10.0	2
Control dosimeters	NA	NA	NA	2
Extra dosimeters	NA	NA	NA	2



New Steering Committee as of May 2023

Virtual meetings ongoing

Webinar on Rn-222 monitoring

Newsletter



- Report on International Conference on ORP Conference
- Report on the 6th African Regional Congress (AFRIRPA06) of The International Radiation Protection Association (IRPA) held in Accra, Ghana from 10 – 13 October 2022
- Report on Regional Training Course on The Establishment and Implementation of a Quality Management System Accra, Ghana, 16 to 20 October 2023
- ISO 17025 Accreditation of a Dosimetry laboratory -the Botswana experience
- Regional Coordination (RAF 9068) meeting to be held in Arusha.
- ORPAS mission held in Botswana.

Proposed activities for 2024 (webinars)

- Quality Management System Tool kit and Measurement Uncertainties
- Interpretations of Inter Laboratory Comparison Results and the needed corrective actions
- The Online version of the National Dose Registry (NDR)
- Accreditation process for Technical Services
- Authorization of medical facilities

ORP Call-for-Action



International Conference on
Occupational Radiation Protection
Strengthening Radiation Protection of Workers – Twenty
Years of Progress and the Way Forward
5 – 9 September 2022, Geneva, Switzerland



Action Plan for Occupational Radiation Protection

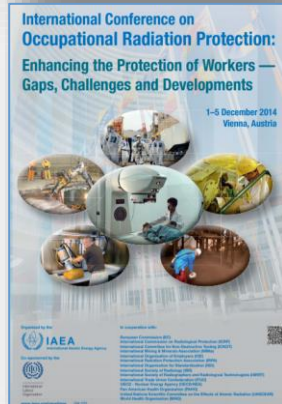
Prepared by the
International Atomic Energy Agency

In co-operation with the International Labour Office

Result of the International Conference on Occupational Radiation Protection, held in Geneva,
Switzerland, 26-30 August 2002

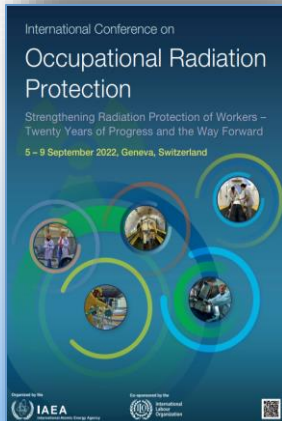


Approved by the IAEA Board of Governors on 8 September 2003



IAEA/ ILO International Action Plan on Occupational Exposure (2003)

Peer review missions to appraise
occupational radiation protection
*“detailed checklist based on the
aforementioned safety guides in
appraising all aspects of occupational
radiation protection in the host
countries”* (purpose is kept the same)



OCCUPATIONAL RADIATION PROTECTION CALL-FOR-ACTION

Protecting workers exposed to radiation



Enhance assistance to Member States in the application of a holistic approach

- ☐ Support practical implementation of international safety standards
- ☒ Facilitate optimization in radiation protection of workers through regional networks
- ☐ Encourage peer reviews of the implementation of occupational radiation protection programmes in Member States
- ☐ Apply a holistic approach

Did you know?

Every year:

~ 12 million workers are exposed to naturally occurring ionizing radiation

~ 0.8 million of those exposed work in the nuclear industry

Occupational Radiation Protection | International Networks



Participants in a 2014 IAEA ILO conference on occupational radiation protection. (C. Villarreal Silva/IAEA)

Why is it important?

Occupational exposure to ionizing radiation can occur in a range of industries, in mining and milling, in medical institutions, in educational and research establishments and in nuclear fuel cycle facilities. The term 'occupational exposure' refers to the exposure of workers incurred in the course of their work.

Networks on occupational radiation protection provide an effective forum for different sectors and regions, for the exchange of valuable information and experiences. The objective of the international networks on occupational radiation protection is to maintain, enhance and develop competences and skills in radiation protection, with special emphasis on the implementation of the 'as low as reasonably achievable' (ALARA) principle for occupational exposures in routine operations.

What do I need to know?

Many organizations are involved in the field of occupational radiation protection. The IAEA supports several networks to assist Member States in sharing their experience and information with each other.

ORPNET: Occupational Radiation Protection Networks

The IAEA launched a web site for Occupational Radiation Protection Networks (ORPNET) in 2010 to link the existing networks and to promote their achievements. ORPNET provides a focal point for communication and exchange of information on occupational radiation protection through networking. It was created following a request in the International Action Plan on Occupational Exposure, created by the IAEA and the International Labour Organization.

ISOE: Information System on Occupational Exposure

ISOE supports the optimization of worker radiological protection in nuclear power plants through a worldwide information and experience exchange network. The system covers more than 90% of the world's nuclear power plants. ISOE is jointly supported by OECD/NEA and IAEA. There are four technical centres: Europe, Asia, North America and the IAEA for the daily operation of this system.

ISEMIR: Information System on Occupational Exposure in Medicine, Industry and Research

The IAEA launched ISEMIR to improve occupational radiation protection in medicine, industry and research. ISEMIR contributes to minimizing the likelihood of accidents by identifying accident precursors and sharing user feedback and experiences. It assists users in benchmarking their arrangements in radiation protection and safety, and hence supports the optimization of occupational radiation protection.

What actions are recommended?

- Member States can join networks and gain better understanding of the optimization of occupational radiation protection through the exchange of information.
- Member States are encouraged to share knowledge, experience, expertise and help build competencies of other network members.
- Member States can develop collaborative partnerships with other experts, as well as access information on IAEA services and training in the field.

Regional networks on occupational radiation protection

EAN: The European ALARA Network

The European Commission established EAN in 1996 to promote a wider and more uniform implementation of the ALARA principle for the management of public, patient and worker exposures. It is the first regional ALARA network.

ARAN: Asia Regional ALARA Network

The IAEA initiated ARAN in Daejeon, Republic of Korea, in December 2007. ARAN facilitates the exchange of information about the practical, cost effective implementation of radiation protection ARAN is coordinated by a Steering Committee.



A storage facility for radioactive materials not in use. (Photo: N. Ibrahim/Malaysia)

RECAN: The Regional European and Central Asian ALARA Network

The IAEA initiated RECAN in 2005 to support the development of a sustainable regional network. In 2017, the network comprised 28 countries in Eastern and Central Europe and Central Asia.

REPROLAM: Latin America ALARA Network

The kick-off meeting for the ALARA network in Latin America was held in Rio de Janeiro, Brazil, in 2011. As of 2017, the network comprised 12 countries.

Resources

IAEA radiation protection of workers
<https://www.iaea.org/topics/workers>

ORPNET - Occupational Radiation Protection Networks
<http://www.iaea.org/orpnet/>

ISOE - Information System on Occupational Exposure
<http://www.isoe-network.net>

ISEMIR - Information System on Occupational Exposure in Medicine, Industry and Research
<https://nucleus.iaea.org/isemir/>

Email: occupational.protection@iaea.org





Occupational
Radiation Protection
Networks
ORPNET



- ORPNET is a web-based network with an ultimate goal to **promote optimization of the occupational radiation protection**.
- With a few exceptions, ORP arrangements in Member States are in line with the IAEA Safety Standards (GSR Part 3 with 52 overarching requirements and GSG-7 guidance)
 - Continuity of BSS-115 requirements for Occupational exposure under planned, emergency and existing exposure situations
- Optimization is one of the more difficult concepts to properly understand and it plays a central role in radiation protection
 - Better understanding or implementation of the optimization process and it may in fact, further complicate implementation
 - Most effective means of designing, constructing and operating the facility (characteristics of the process is not always same)
- Efforts are needed in improving implementation of optimization and strengthening the safety culture, which justifies the ORPNET more than 2 decades of operation with its traditional approach / look



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

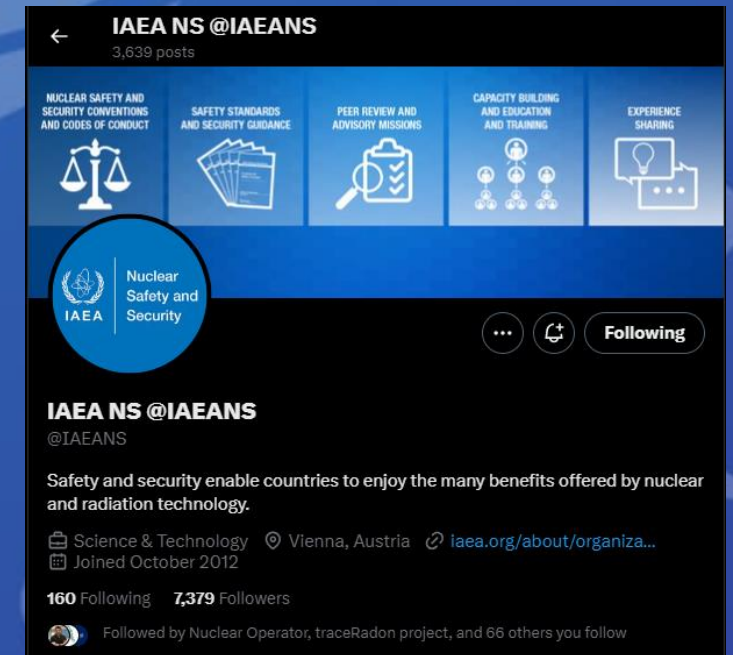
Thank you

H. Burçin Okyar
Occupational Radiation Protection Unit
Radiation Safety & Monitoring Section, NSRW
h.b.okyar@iaea.org

IAEA ORPNET:

<https://www.iaea.org/services/networks/orpnet>

<https://nucleus.iaea.org/sites/orpnet/home/SitePages/Home.aspx>



IAEA NS in X
@IAEANS