

OCCUPATIONAL RADIATION PROTECTION CALL-FOR-ACTION

Protecting workers against possible exposure to radiation

Why is occupational radiation protection important?

Ionizing radiation is part of the human environment, found for instance in cosmic rays and naturally occurring radioactive material. Industry, medicine, energy production, agriculture and research are some of the many areas in which ionizing radiation is applied for beneficial purposes. In the absence of adequate and effective safety and protection measures, ionizing radiation can cause harmful effects, such as skin burns when radiation doses exceed a certain threshold level, and long term effects, such as cancer and hereditary diseases, which are also known as non-stochastic (deterministic) and stochastic effects, respectively. Thus, the potential radiation risk needs to be properly assessed and controlled.

Around 24 million workers worldwide are monitored for exposure to natural and artificial ionizing radiation, according to the UNSCEAR report on Evaluation of Occupational Exposure to Ionizing Radiation (UNSCEAR 2020/21 report, Volume IV, Annex D). Of these, about 12.6 million work in occupations that involve natural sources of radiation and the rest in occupations that involve exposure to artificial sources of radiation. The exposure of workers to ionizing radiation in the course of their work is regarded as occupational exposure.

Joint efforts in the protection of workers

Occupational radiation protection is essential for the safety and health of workers. There is a growing awareness of exposure due to natural sources in industrial process involving Naturally Occurring Radioactive Material (NORM), to radon in workplaces, and of cosmic radiation exposure of air and space crew. In medicine and other industries, the rapid development and wide use of new nuclear technologies also poses challenges to be addressed.

The IAEA's programme on occupational radiation protection is designed to ensure appropriate control of radiation exposure in the workplace. The international adherence to the IAEA Safety Standards and to the International Labour Organization's Convention No. 115 is essential to ensure overall radiation protection of workers.

The Radiation Protection and the Safety of Radiation Sources: International Basic Safety Standards (GSR Part 3) addresses all situations involving radiation exposure that is amenable to control as well as requirements on exemption and clearance. The IAEA actively supports and promotes occupational radiation protection efforts across the world by developing safety standards and guidelines for Member States.

1st International Conference

The first International Conference on Occupational Radiation Protection: Protecting Workers Against Exposure to Ionizing Radiation was held in Geneva, Switzerland, from 26 to 30 August 2002. The conference covered the whole area of occupational radiation protection, including infrastructure development, radiation monitoring, stakeholder involvement and the probability of occupational harm attributable to radiation exposure.

The conference was hosted by the Government of Switzerland, organized by the International Atomic Energy Agency (IAEA) and convened jointly with the International Labour Organization (ILO). The Conference was co-sponsored by the European Commission (EC) and held in cooperation with other international organizations.

The recommendations and conclusions from the conference resulted in an International Action Plan on Occupational Radiation Protection, which was approved by the IAEA Board of Governors in September 2003. The Action Plan focused on the efforts of the relevant international organizations, in particular the IAEA and ILO, to assist their Member States in establishing, maintaining and, where necessary, improving programmes for the radiation protection of occupationally exposed workers. The Action Plan proposed 14 actions in response to the nine high-priority areas identified by the conference. A steering committee comprising representatives of the Member States and international organizations was established to oversee the implementation of the Action Plan. In 2011, at its fifth meeting, the steering committee considered all 14 actions to be successfully completed and the Action Plan was closed.

2nd International Conference

The second International Conference on Occupational Radiation Protection: Enhancing the Protection of Workers — Gaps, Challenges and Developments was held at the IAEA's Headquarters in Vienna, Austria, from 1 to 5 December 2014.

The conference was organized by the IAEA and co-sponsored by the ILO in cooperation with 15 other international organizations. More than 500 participants attended the conference from more than 79 Member States and 21 international organizations and associations.

The conference aimed to facilitate:

- Exchange of information and experience in the field of occupational radiation protection;
- Review of advances, challenges and opportunities since the first conference on this topic;
- Identification of areas for improvement;
- Formulation of conclusions and recommendations.

The major outcome of the weeklong discussions was the Occupational Radiation Protection Call-for-Action, with nine key areas requiring global attention.



3rd International Conference

The third International Conference on Occupational Radiation Protection: Strengthening Radiation Protection of Workers — Twenty Years of Progress and the Way Forward was once again hosted by the Swiss Government, in Geneva, from 5 to 9 September 2022. It was organized by the IAEA, co-sponsored by the ILO and held in cooperation with 16 other international organizations.

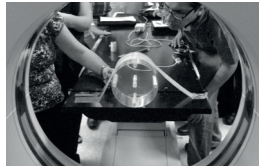
Over 700 participants from 105 Member States and 17 international organizations, among them around 300 in person, participated in the conference.

Conference discussions focused on three essential questions:

- What are the technical and regulatory advances, challenges and opportunities since the second conference?
- What is the global situation on radiation protection of workers?
- Which actions should be prioritized based on the vision for the future?

In a similar manner to the previous two conferences, conference participants identified nine actions to enhance the protection of workers, including training in occupational radiation protection for exposed workers, improving commitments to safety culture at management levels and promoting a safety culture among workers, and continuing the exchange of operating experiences. These nine actions are on the pages that follow:

01



Implement international safety standards and ILO Convention No. 115

- Assist Member States in the implementation of programmes on radiation protection of workers
- Strengthen regulatory infrastructure on occupational radiation protection
- Update and develop detailed regulatory guidance



A worker takes an air sample in a coal mine in Poland.



Develop and implement new safety guides at the international level

- Develop new international safety guidelines for occupational radiation protection in different exposure situations, including advanced accelerator facilities and interventional radiology
- Develop guidance for new technological applications



A worker checks the radioactive contamination level on the inner surfaces of a pipe.

03



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

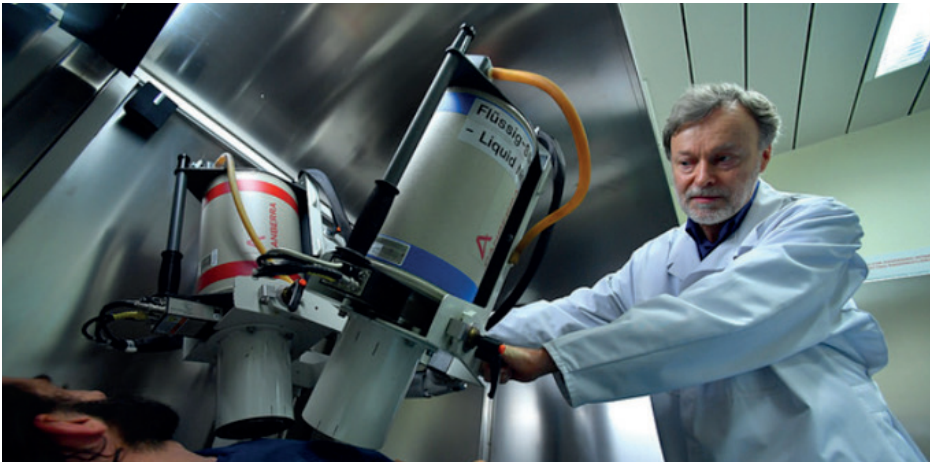
~ 0.8

million of those exposed work in the nuclear industry



Promote exchange of operating experience and innovations

- Support experience exchange in occupational radiation protection in nuclear power plants
- Support experience exchange particularly in industrial radiography, interventional cardiology and NORM industries
- Facilitate experience exchange on occupational radiation protection in research and education



A worker undergoes whole body counting in a dosimetry service laboratory at the IAEA.

05



Strengthen education and training in occupational radiation protection

- Equip Radiation Protection Officers (RPOs) and workers with the necessary knowledge and skills
- Maintain periodic refresher training in radiation protection and practical measures to reduce exposures



Preparation of radon dosimeters that will be used by workers who might be exposed.



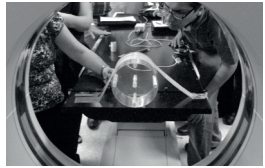
Improve safety culture in occupational radiation protection

- Promote safety culture in regulatory authorities through outreach and education
- Improve commitment to safety culture at management levels
- Promote safety culture among workers



Workers erect a container for receiving wastes generated during decommissioning.

07



Support the development of young radiation protection professionals

- Support the development of young professionals through communication, networking, training, research and hands-on experience, particularly those in developing countries
- Invite young professionals to participate in technical meetings and conferences



An IAEA staff member explains in vitro analysis for internal dosimetry.



Strengthen capacity building in the monitoring and assessment of occupational exposure

- Support impact assessment and adoption of the Operational Quantities for External Radiation Exposure (ICRU 95 report)
- Improve the capability for monitoring exposure to neutron, internal exposure and dose to the eye lens
- Promote computational dosimetry for assessment of non-uniform exposure
- Enhance the capacity of technical service on assessment and monitoring including the establishment of quality management systems
- Support the establishment of National Dose Registries (NDRs)



An electronic personal dosimeter worn by workers who might be exposed to radiation.

09



Apply a **graded approach** in existing exposure situations

- Balance radiological features versus economic uses
- Optimize the use of regulatory and operator resources
- Include radon exposure control to national legislative and regulatory frameworks
- Establish national action plans on radon exposure control



Workers dismantling a turbine hall measure scrap metal for traces of radiation.



Would you like to know more?

The IAEA and other international organizations provide freely available resources on line:

- ISEMIR IAEA Information System on Occupational Exposure in Medicine, Industry and Research: nucleus.iaea.org/isemir
- Occupational Radiation Protection Appraisals (ORPAS) missions to Member States:
www-ns.iaea.org/appraisals/radiation-appraisals.asp
- Resources available at the ILO website: bit.ly/29nwT43
- ORPNET, a web-based network on optimization of the occupational radiation protection: goto.iaea.org/orpnet/
- An ILO code of practice - Radiation protection of workers (ionizing radiation): bit.ly/2c7fMap
- NORM symposia organized every three years: bit.ly/3sO7HAT
- Occupational Radiation Protection Safety Guide:
bit.ly/2c7fUqA
- Safety Report on Radiation Protection of Itinerant Workers:
bit.ly/2cjHUoi
- Road map tool for Non-Destructive Testing (NDT) companies to assess radiation protection: bit.ly/3Rbva8o



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[ilo.org/safework/areasofwork/
radiation-protection/lang--en/index.htm](http://ilo.org/safework/areasofwork/radiation-protection/lang--en/index.htm)



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