WORLD NUCLEAR ASSOCIATION

ICRP-SSM Webinar
The Role of ICRP and Stakeholders in the Future of Radiological Protection

Operator Expectations of ICRP

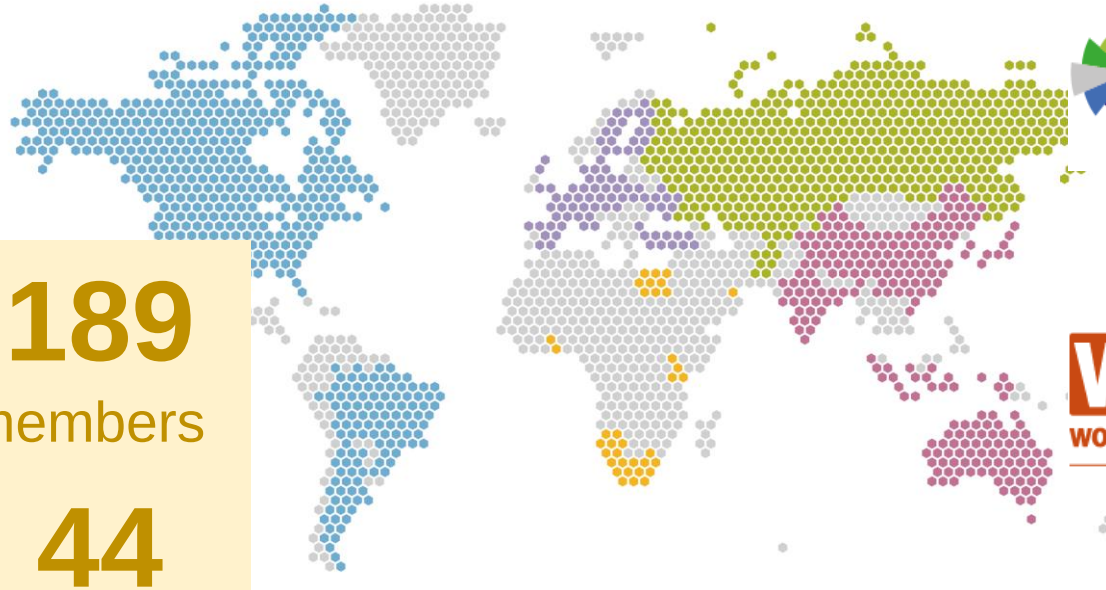
Sameh Melhem, RP program lead
Staff director of RPWG

13 June 2023

Content

- Overview of the World Nuclear Association (WNA) & Radiological Protection Working Group (RPWG).
- Nuclear industry performance record.
- Experience of practitioners regarding RP system.
- Moving the RP system forward.
- Inform the next update of the ICRP general recommendations.
- Conclusions.

We Are The Voice of The Global Nuclear Industry



189
members

44
countries

- We work with, support and represent the industry
- We are a thought leader for nuclear energy in the global energy debate
- We inform and communicate on nuclear energy
- We develop the nuclear leaders of tomorrow

The Radiation Protection Working Group (RPWG)

Working Group Structure

Fuel Cycle WGs

- Fuel Report
- Used Fuel Management
- Transport
- International Network for Safety Assurance of Fuel Cycle Industries

Nuclear Deployment & Value Chain WGs

- Cooperation in Reactor Design Evaluation and Licensing (CORDEL)
- Supply Chain and Long-term Operation
- Economics, Law and Finance
- Decommissioning

Cross-Cutting WGs

- Radiological Protection
- Security
- Workforce & Talent Development
- ESG

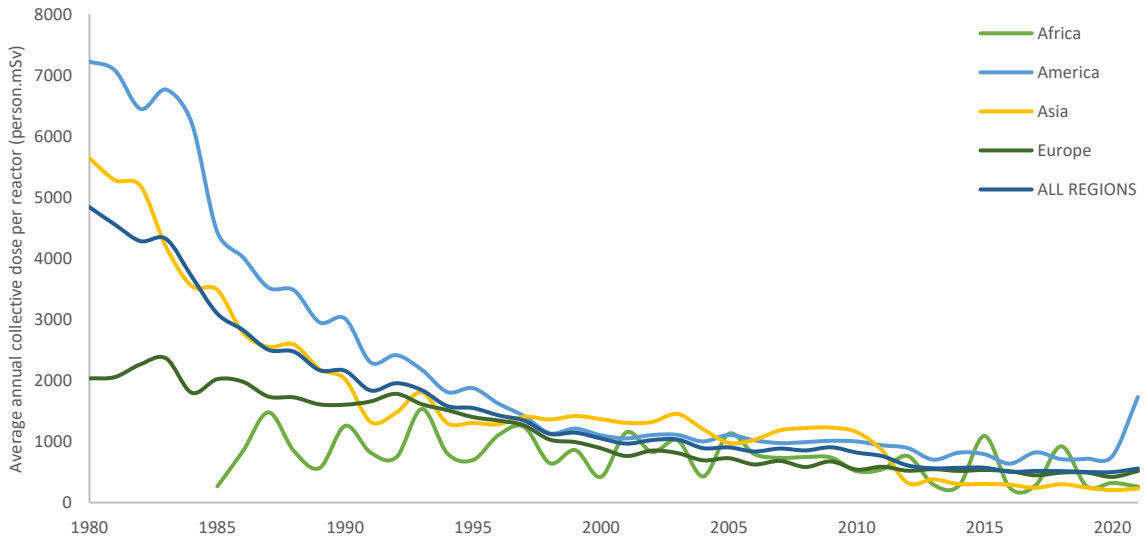
Advisory Groups

- DG Advisory Council
- Communication Group
- Innovation Panel
- Cooperation Forum for Nuclear Technology Associations
- End Energy Users Panel
- Emerging Markets Panel

Members' Forum

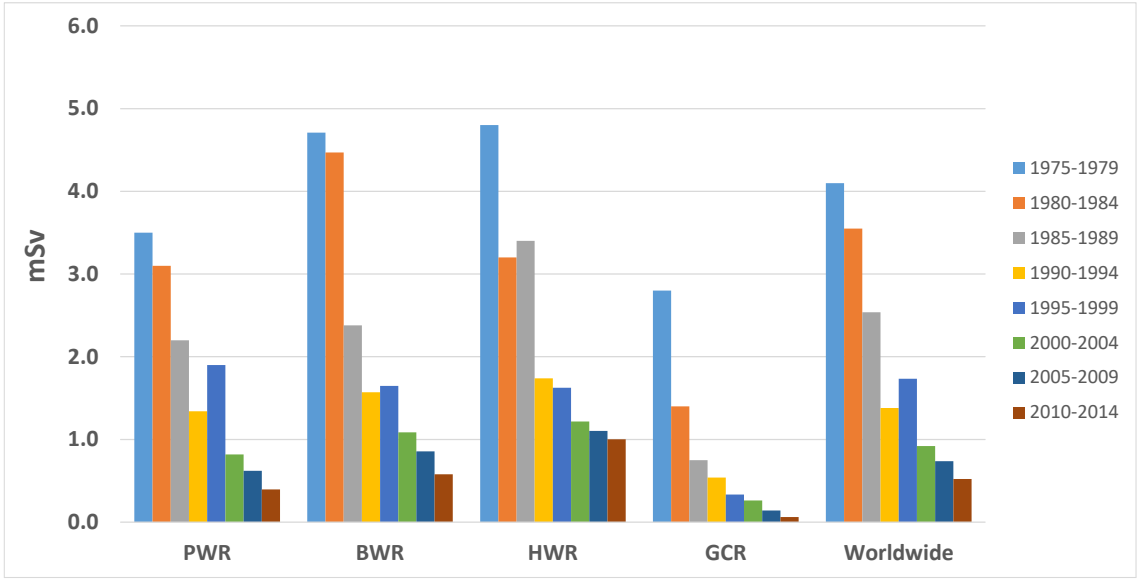
- Ensure that the RPWG is recognized as the nuclear industry's leading body of experts in the application of RP.
- Continue to share knowledge and ideas around maintaining and improving radiation safety.
- Influence the development of a balanced RP framework and standards by ensuring working group's perspectives are relayed, understood and discussed.
- To work on the revision of the next ICRP-General Recommendations
- To prepare for the upcoming generational change and improve education on RP

The Nuclear Industry Performance Record



Annual average collective dose per reactor per region for the public.

Source: Data from ISOE



Annual average effective dose for workers at nuclear power reactors.
Sources: Data from ISOE and the UNSCEAR Occupational Exposure Survey

Experience of Practitioners Regarding RP System

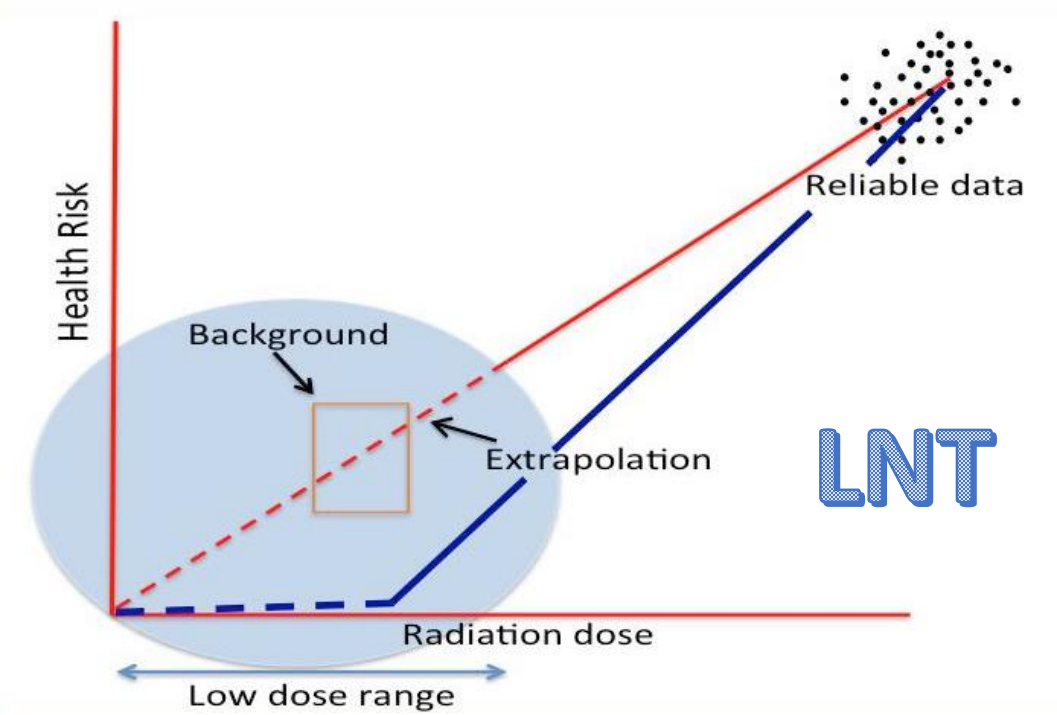
- RP system is becoming more complex and difficult to interpret.
- RP system has become overly conservative and applications in the regulatory system are even more conservative.
- Regulatory tendency to minimize the dose leads to mis-interpretation of the application of optimization principle.
- Radiation hazard is one of many hazards at an operational site.

Experience of Practitioners Regarding RP System

- Significant (disproportionate) costs for managing radiation.
- Disproportionate outcome in terms of wider non-radiological hazards.
- Current negative perceptions of radiation are partly fed by the system of protection:
  - Public dose limit less than natural background implies man-made radiation is more dangerous than natural
  - Lot of ‘attention’ on very low exposures Leads to unnecessary constraints on operations, new projects and waste management

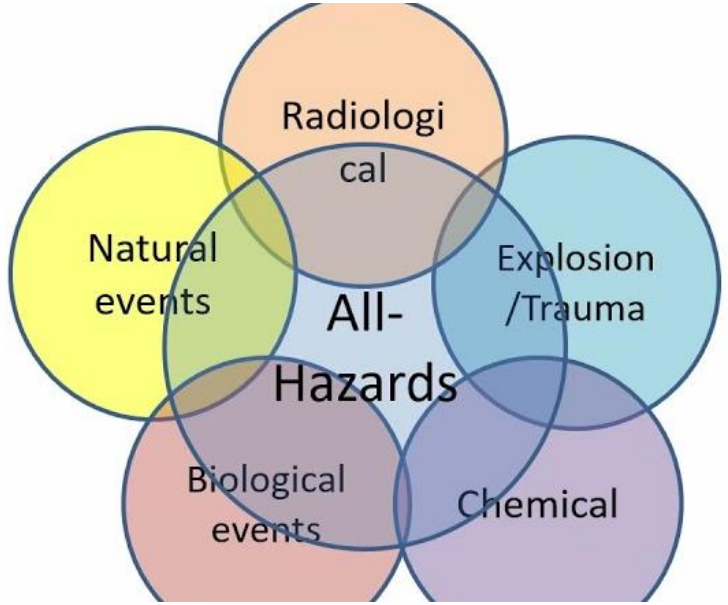
Experience of Practitioners Regarding RP System

- While accepting that the LNT-based approach is the best current simple approach/model for developing an RP system.
- This could promote the idea that all radiation is harmful
- But “If there is a risk, then indeed it is very small, and well within the range of risk usually accepted in society”.



Moving The RP System Forward (Proportionality and Holistic Approach)

- Decision-making at low doses must maintain:
  - Decisions are more understandable and relevant to the general public
  - Proportionality with the very low risks involved and removing undue conservatisms
  - Accepting that radiation is just one of many potential hazards that must be considered
- Reinforce that optimization is not minimization.
- Optimize the allocation of resources to reflect the level of risk,
- Radiation is one of a number of hazards that must be managed.
- Feedback from industry highlights the need for the evolution of the ALARA principle to ensure it embeds “ALL Hazards”, ensures a sustainable outcome, and is informed by stakeholder engagement.



Moving The RP System Forward (Effective Communication & Public Understanding)

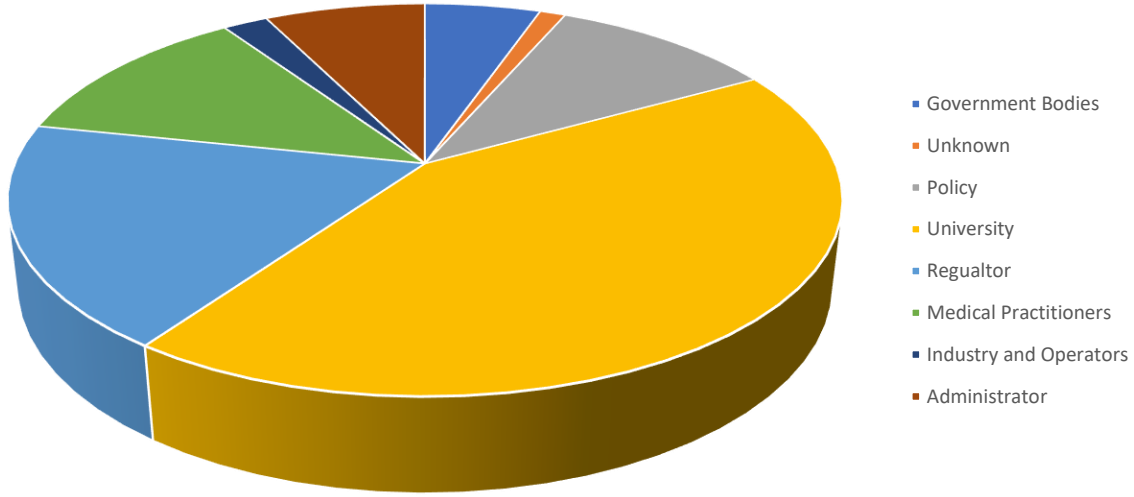
- Observations and experience of practitioners should be collected and communicated with regulators and operators.
- Complexity & understandability of RP system (e.g., Dose limitation vs. dose limits).
- The Need for simplification of the RP system.
- Improves communication of radiation risk to the public and wider stakeholders to allow them to make informed decisions on “What is Safe”
- The importance of communicating with the public on radiation and risk: (e.g. use of the context of natural background radiation)

Dose from Natural background: 2-5 mSv

Dose from Nuclear industry: few micro Sv

Inform The Next Update of The ICRP General Recommendations.

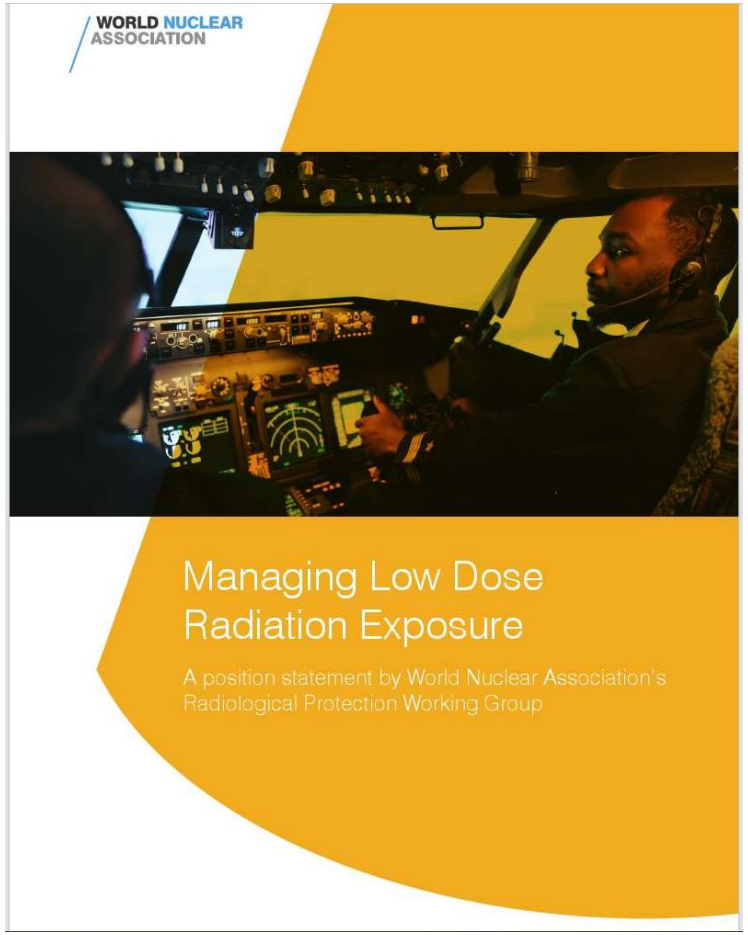
- Based on the current list of ICRP Task Groups the areas of focus from nuclear industry perspective would be
  - TG91 on Radiation Risk Inference at Low Dose
  - TG99 and 105 relating to RP of the Environment
  - TG114 on Reasonableness and Tolerability in the System of Radiological Protection.
  - TG124 on Application of the Principle of Justification.
  - TG125 on Ecosystem ServicesComplexity & understandability of RP system (e.g., Dose limitation vs. dose limits).
  - TG128 on Individualization and Stratification in RP
  - Upcoming TGs on Communication and Education & training (May initiate late next term, ca 2027/28)



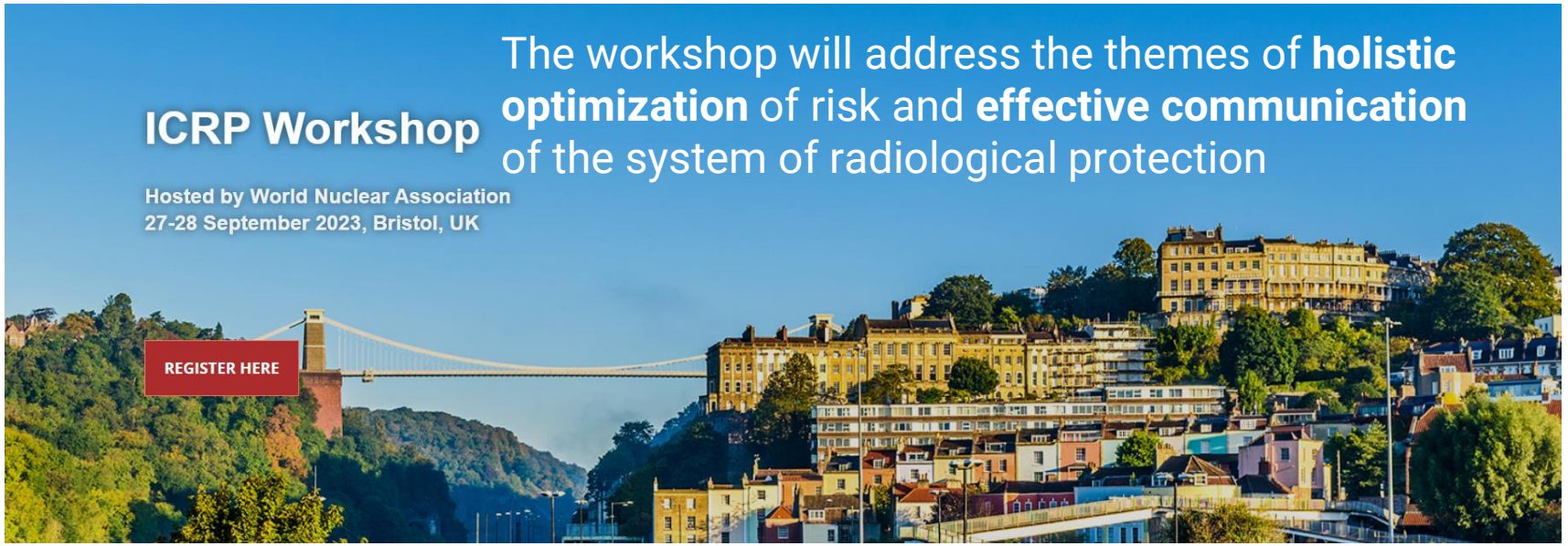
Currently, the Nuclear Industry Practitioners represent <1% of the ICRP community.

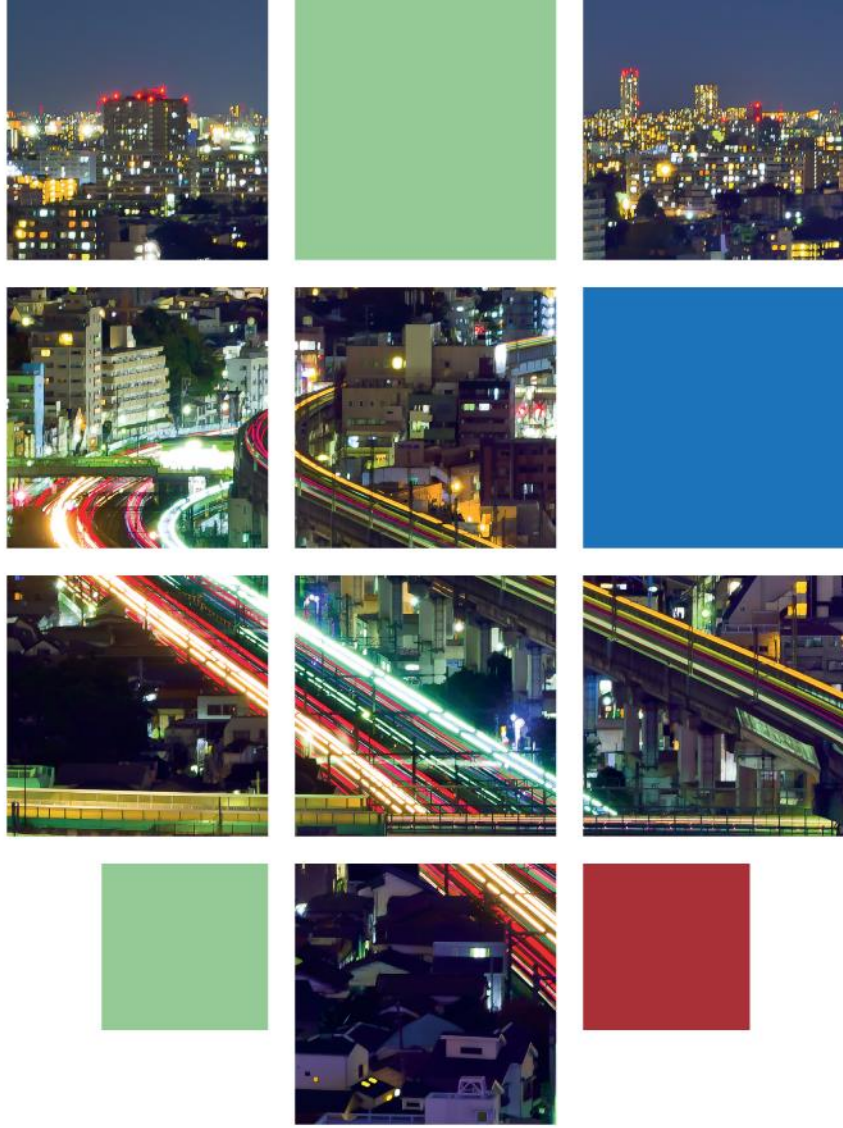
Conclusions

- The nuclear industry has good records in controlling and reducing occupational and public exposure to ionizing radiation.
- Give greater emphasis to natural background exposure and its variability, both in general decision-making and in public communication
- The nuclear industry recommends to take into account all-hazards approach in the future system of protection
- The nuclear industry recommends implementing a more realistic graded approach
- The World Nuclear Association will participate actively in the revision of the ICRP general recommendations as the international voice of nuclear industry providing the perspective of RPWG members.



WORLD NUCLEAR ASSOCIATION





Thank you

www.world-nuclear.org
info@world-nuclear.org