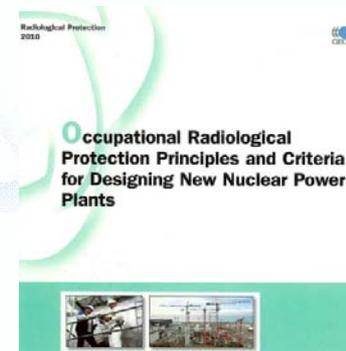


Occupational radiation protection principles and criteria for designing new nuclear power plants

introduction of the publication

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2011 ISOE North American ALARA Symposium and EPRI Radiation Protection Conference

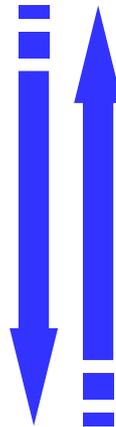
- Presentation by Richard Doty, in collaboration with Willie Harris and David Miller, members of the Expert Group on Occupational Exposure, January 2011

Why it is important to address ORP at the design stage?

consider **full life-cycle at the design stage**



Available feedback from
maintenance and
dismantling



Organize **training and knowledge
management through extended life-
cycle** (2-3 generations of workers)

Importance of networking to enable **information collection
and exchange** on ORP during design and over the full life-
cycle

integration of ORP into the design may **save time, money and exposure**
during subsequent operation

New paradigm: From “a posteriori” to “a priori”

- ORP for future generations of workers (design for 60 or more years)
- Integration of ORP in the design and conception phases
- Identification and optimization of cost - benefit
- Precaution for reduced exposures over the full NPP life cycle (operation, maintenance, transport, decommissioning)
- Risk - balanced optimization, considering
 - other health hazards for workers
 - exposure of worker vs. public, environmental, regulatory needs
- Awareness of the positive as well as negative aspects of ORP

Based on experience of experts and feedback from existing facilities

Intended audience and aims

Audience

1. Executive management of nuclear power plants
2. Designers
3. Manufacturers
4. Contractors
5. Authorities responsible for regulating occupational radiation exposure
6. ALARA Committees

Aims

1. Assist in assessment of ORP aspects of design and license applications
2. Provide for a technical framework for making judgements on ORP at the design stage
3. Provide examples of actual tools (e.g. ALARA committees)
4. Provide guidance on using ALARA checklists

What is in the report?

Major issues addressed in individual chapters

Occupational radiation protection principles at the design stage of nuclear power plants



Lessons learned, knowledge management, education and training



Integrating occupational radiation protection criteria during the design phase



Evaluation and integration of occupational radiation protection cost in design process

Structure of the publication

1. Executive summary page 9
2. Introduction and scope 15
3. 4 chapters on different aspects of ORP,
including 14 sub-chapters 21
4. Conclusions 61
5. Five appendices 65

Foreword, List of acronyms, Figures, References
108 pages

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Free download: <http://www.nea.fr/rp/reports/2010/nea6407-occupational-rp.pdf> .

Chapter Titles

- ORP principles at the design stage
- Lessons learned, knowledge management, education, and training
- Integrating ORP criteria during design
- Evaluation and integration of ORP cost into design

Titles of Appendices

- ALARA design check-list
- ALARA engineering design principles
- Application of ALARA to facility system design
- Applications for licenses – design aspects re ORP
- Optimisation of ORP in the design of the EPR

Major conclusions

Issues to be addressed at the design phase

1. Basic ORP principles – **justification, optimisation and dose limitation** - are to be maintained through the expected full life-cycle, addressing also international and national guidance and regulations.
2. **Optimisation** should consider not only **potential health risks** from ionising radiation, but also **other potential risks to the workers' health** in order to **allocate resources** in a well balanced way so that the best worker protection is achieved.

Major conclusions, cont'd.

3. Organisation of **training and knowledge management** is to ensure the availability of highly qualified personnel and adequate **design-basis documentation** over the full lifetime of the facility, from design to decommissioning.
4. Active **networking in support of information, experience and data exchange and assessment** is needed to maintain sustainable **implementation of good practice**, and ensure an effective traceability and use of lessons learned.

Major conclusions; cont.

- 5. Integration of ORP principles and criteria into all components and future operations is needed to save time, money and exposure over the lifetime of the facility.**

Issues not to be forgotten at the design stage

Cooperation

Multi-disciplinary and multi-organisational co-operation on ORP decisions at the **design stage** is important.

Cost

Evaluation of **investment and maintenance costs** related to ORP will be important at the **design stage**

Experience

Recognising the importance of building on **existing experience, knowledge management structures, processes and procedures** (*related to ORP*) must be **designed** into future plants.

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Examples of CRPPH Activities of Working parties and Expert groups:

- Nuclear Emergency Matters (WPNEM)
- Occupational exposure (**EGOE** and ISOE)
- Best Available Techniques (EGBAT)
- Qualified Human Resources (EGQHR)
- Radiological Protection of the Environment (EGRPE)
- Implications of ICRP Recommendations (EGIR)
- Evolution of the System of RP (Asian conferences and Science & Values workshops)
- Exclusion of Reactors in Decommissioning from the Paris Convention
- Consumer Products Containing Radioactive Substances

CRPPH Expert Group on Occupational Exposure

Scope : Policy and strategic areas of occupational radiation protection with a focus on the nuclear power sector

Subjects being addressed:

ORP principles and criteria for designing new NPPs (2007-2010); published in 2010

Implementation of ICRP recommendations - focus on dose constraints; foreseen to be completed in 2011

Radiological protection policy and operational issues

Radiological Protection
2010



Occupational Radiological Protection Principles and Criteria for Designing New Nuclear Power Plants



Thank you for your attention