

OECD Nuclear Energy Agency
International Atomic Energy Agency



Emerging Challenges and Opportunities in Occupational Radiation Protection for Nuclear Power Plants

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ISOE – Information System on Occupational Exposure

- **Created in 1992** by the Nuclear Energy Agency of OECD
- Joint secretariat with IAEA
- **Members (as of March 2012):**
 - Nuclear power plant utilities (70 utilities in 29 countries)
 - RP and/or Safety authorities (24 countries)
- **Objectives**

Share dose reduction information, operational experience and information to improve the optimisation of radiological protection at nuclear power plants.
- **Main Tools / Products**
 - ISOE Database
 - Annual and topical reports
 - Regional and International Symposia
 - Web site: documents, discussion forum, access to the database and analysis module

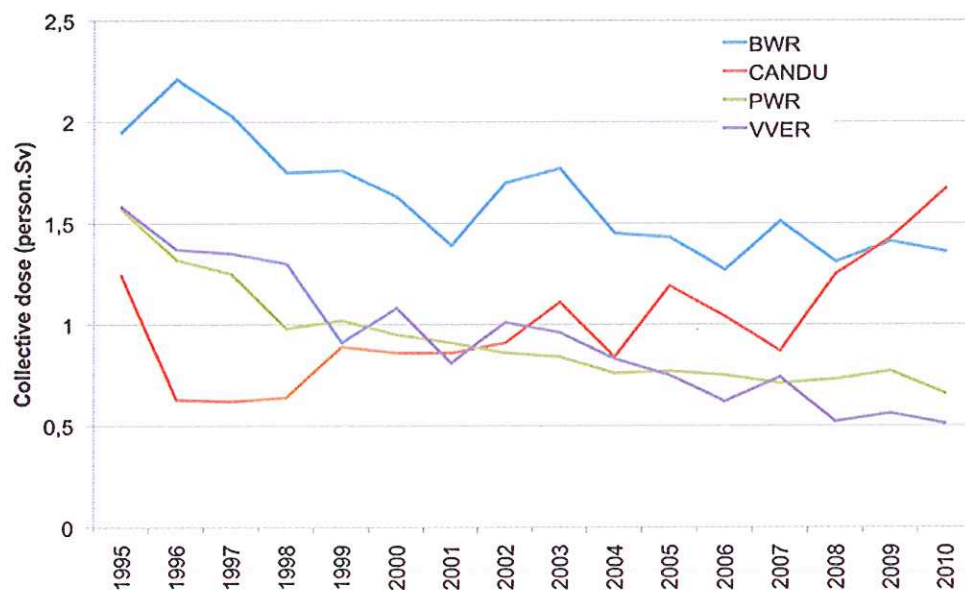


Challenges (1)

Collective exposures

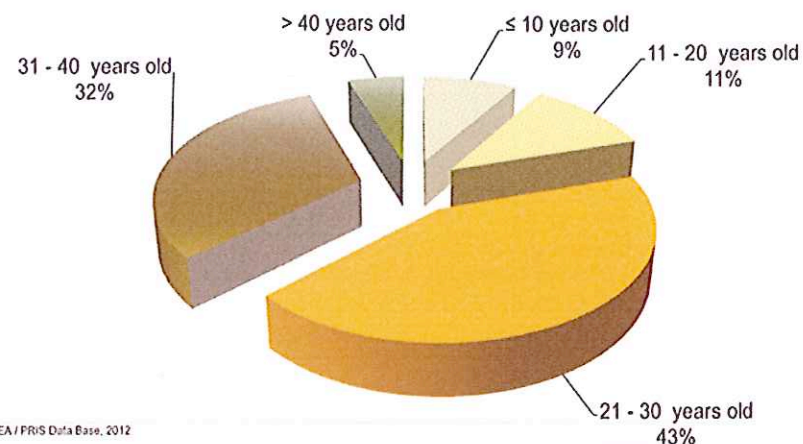
- Significant decrease of collective exposure since
- But still need to be vigilant to maintain the good results
 - Ageing of reactors
 - Willingness to increase their life duration
 - Safety improvement (post stress-test)

Average Annual Collective Dose per Reactor



Source: ISOE Data Base, 2012

Age Distribution of the 436 Operating Reactors in the World



Source: IAEA / PRIS Data Base, 2012



Challenges (2)

Individual exposures

- **Distribution of individual doses**
 - Need to search for more equity: reducing in priority the individual dose of the highly exposed workers

- **Implementation of ICRP 103 / IAEA or EC BSS**
 - New European BSS: annual dose limit at 20 mSv/year (instead of 100 mSv over 5 years and max. 50 mSv/year)

 - Definition and implementation of individual dose constraint
 - Specific dose values for site (eg. 'administrative individual dose limits' for each site)
 - Dose constraint for general tasks ?



Challenges (3)

Human Resources Management

- **New workforce needed**
 - Retirement of current workers
 - New built (with a specific issues for new 'nuclear countries')
- **Education and training**
 - Maintain/increase vigilance
 - ALARA culture
 - Transmission of knowledge
 - Harmonisation between countries
- **Itinerant trans-boundary workers**
 - Different dose limits
 - Dose recording systems for foreign doses
 - Different RP management systems (eg. Classification of areas)



Challenges (4)

■ **New Built**

- Incorporation of lessons learned from operation and decommissioning of existing plants
- New 'nuclear countries'

■ **Decommissioning**

- Specific risks to be managed (eg. alpha)
- New type of workers, not used to ionising radiation
- Challenges to share at the national/international level decommissioning experiences

■ **Integration of lessons-learned from past accident**

- Procedures for occupational RP management during severe accident initial response and recovery efforts



Opportunities

- **Increasing level of knowledge**
 - 30 years of operating experience
 - Worldwide networking

- **New technologies**

- **New standards**
 - Towards a continuous improvement of protection