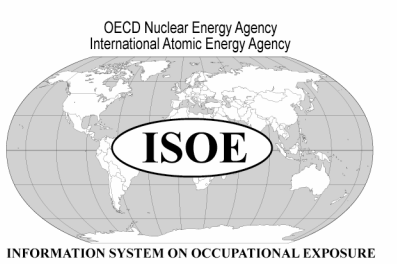

ISOE - Information System on Occupational Exposure

Ten Years of Experience

Stefan Mundigl
OECD Nuclear Energy Agency
ISOE Secretariat

Khammar Mrabit
International Atomic Energy Agency

Carl-Göran Lindvall
Barsebäck Nuclear Power Plant

OECD Nuclear Energy Agency
International Atomic Energy Agency

ISOE

INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE

ISOE Objective

Provide a forum for radiation protection experts from, both utilities and regulatory authorities, to discuss, promote and co-ordinate international co-operative undertakings in the area of protection of workers at nuclear power plants

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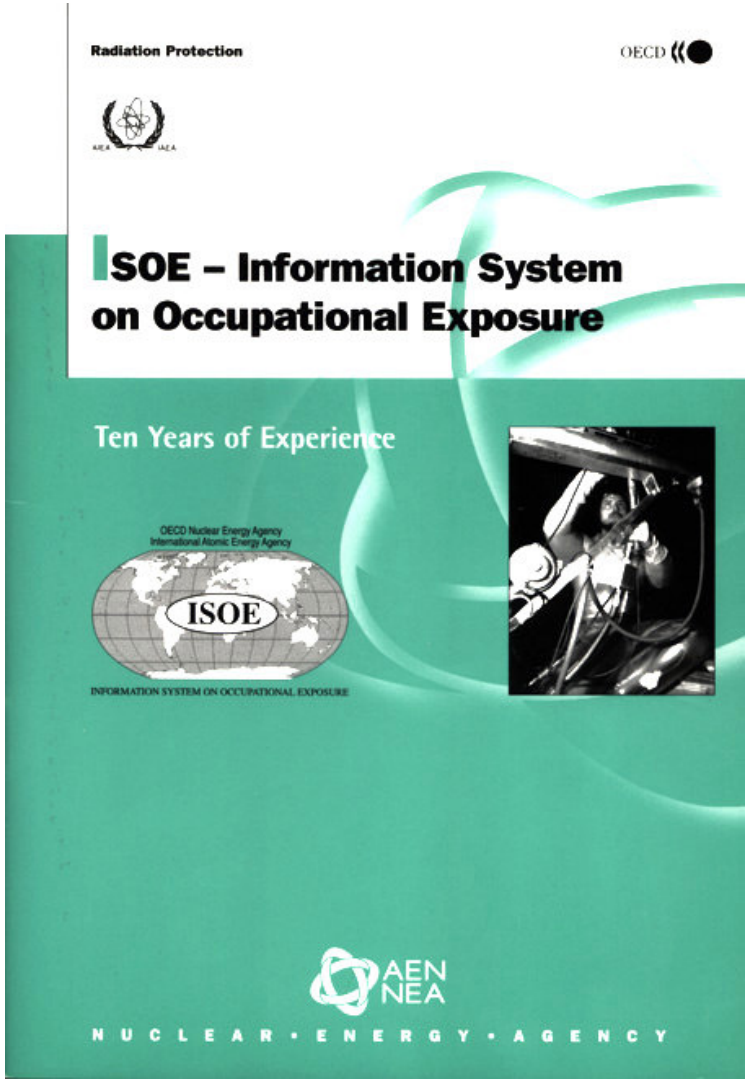
International Atomic Energy Agency

ISOE

INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE

ISOE
Ten Years of Experience

- Created in 1992
- Promoted and sponsored by Nuclear Energy Agency (NEA) and International Atomic Energy Agency (IAEA)
- 10 years of experience in operational radiation protection
- Utilities and regulatory authorities



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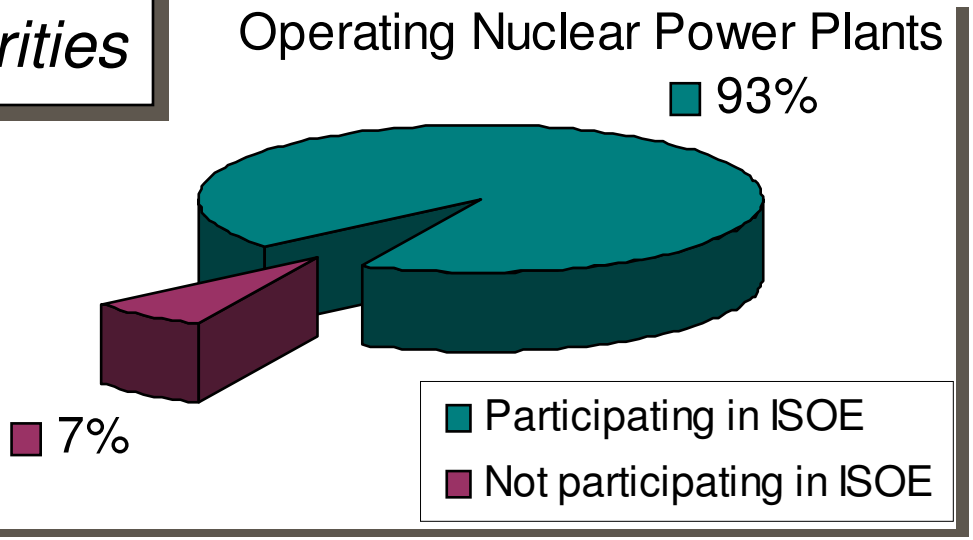
Participation in ISOE (End 2002)

461 Nuclear Power Plants
- *407 in operation*
- *54 in cold-shutdown or some phase of decommissioning*

73 utilities from 29 countries

25 national regulatory authorities



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INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE

ISOE Products

ISOE Databases	World's largest database on occupational exposure data from nuclear power plants
Annual Reports	Yearly overview of the achievements of the ISOE Programme
Information Sheets	Detailed studies and analyses of ISOE data Information on current issues
Rapid Communication	System for rapid communication of radiation protection information
Workshops and Symposia	International ISOE Workshops on Occupational Exposure Management in NPPs

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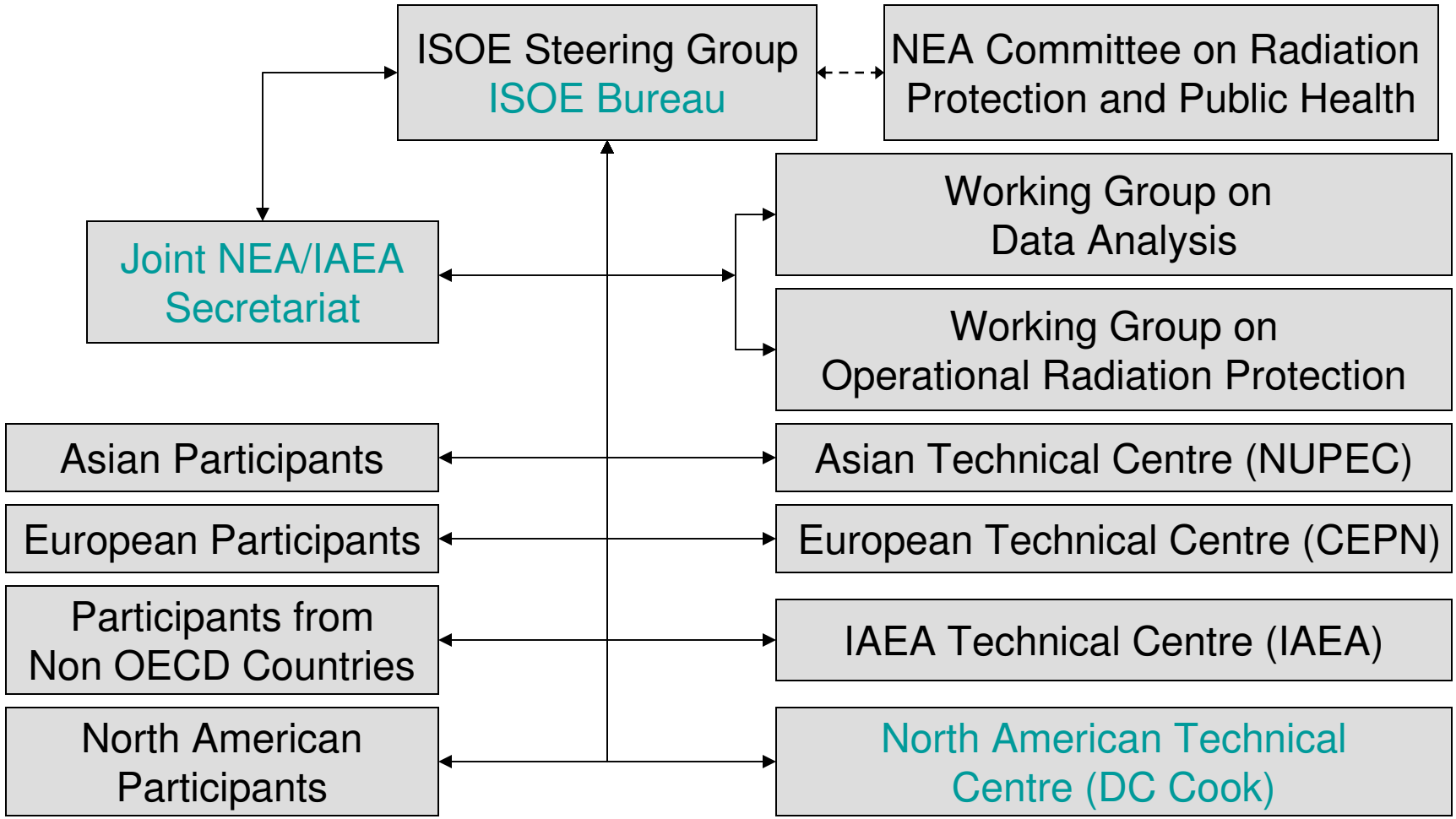
INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE

ISOE Management



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INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE

Radiation Protection Professionals benefit from ISOE

- Benchmarking Analyses
- Experience Exchange
- Symposia and workshops
- Work Management
- Monetary Value of collective dose
- Annual outages in European reactors
- Steam generator replacements
- In-service inspection in North America

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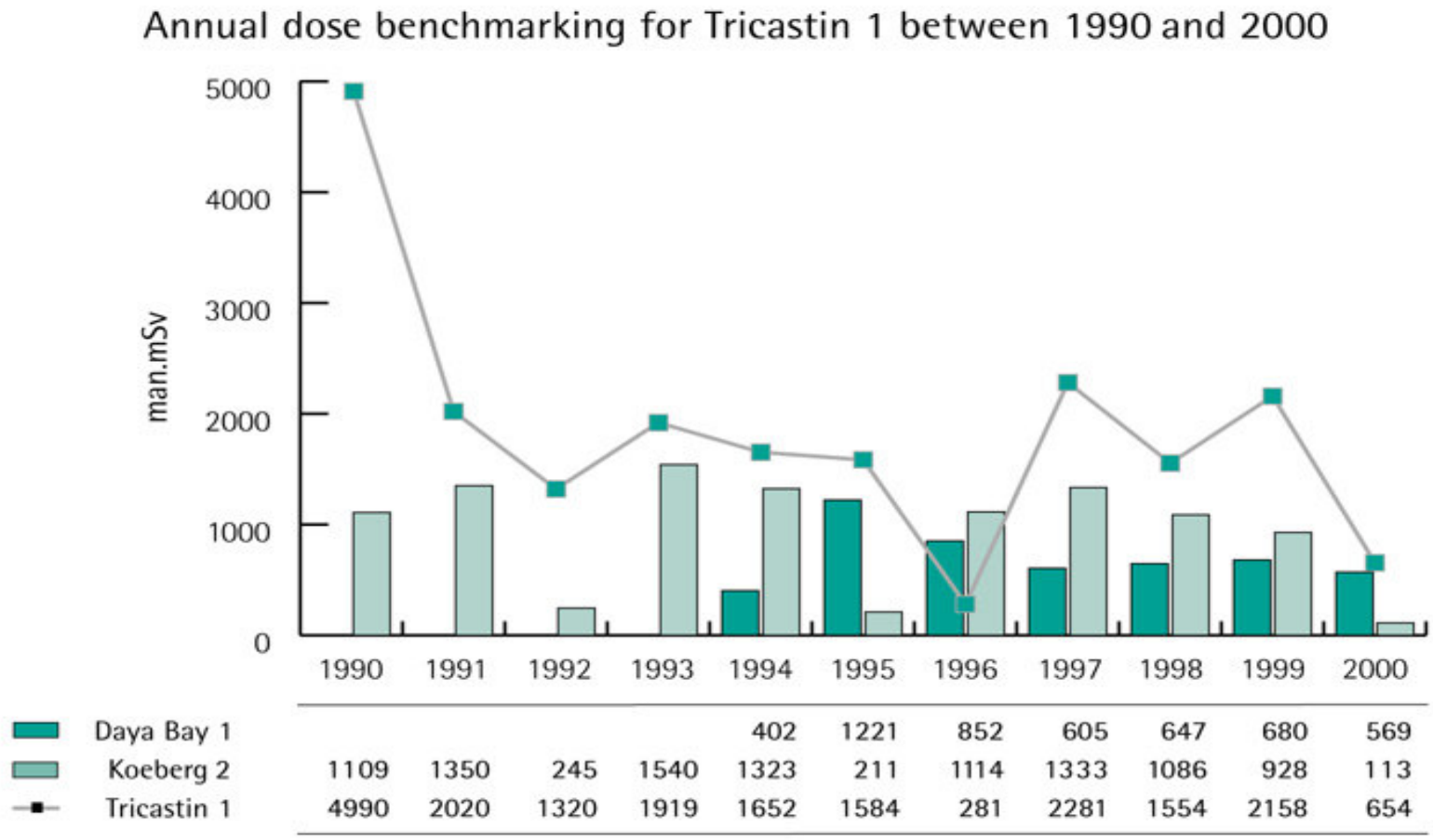
Annual Doses



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Daya Bay 1					402	1221	852	605	647	680	569
Koeberg 2	1109	1350	245	1540	1323	211	1114	1333	1086	928	113
Tricastin 1	4990	2020	1320	1919	1652	1584	281	2281	1554	2158	654

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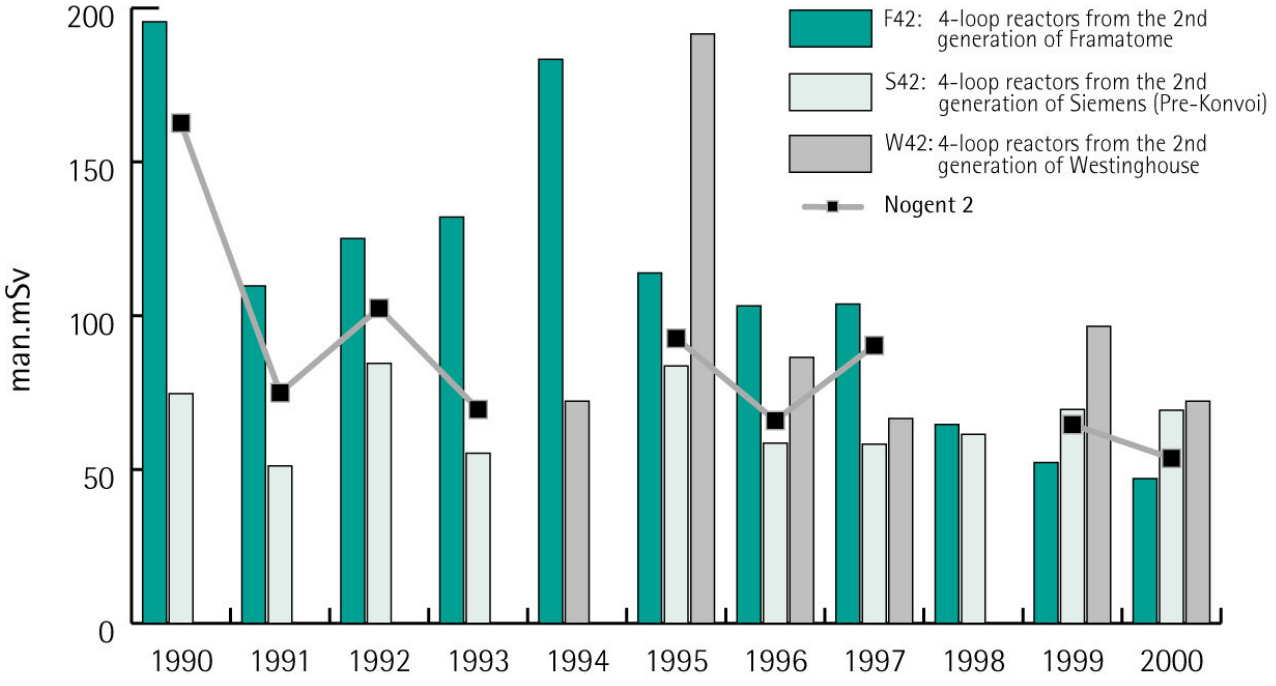
Refuelling

Annual dose benchmarking on the job "refuelling" for Nogent 2 between 1990 and 2000



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
F42	196	110	125	132	183	114	103	104	65	52	47
S42	75	51	85	55	72	84	59	58	61	69	69
W42						192	86	67		97	72
Nogent 2	163	75	102	70		93	66	90		65	54

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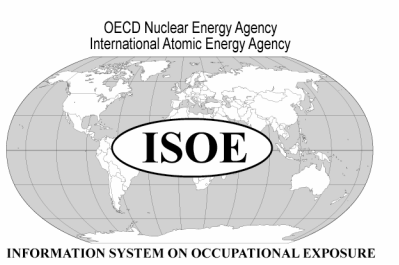
INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE

Symposia and Workshops

Objectives:

- Provide large forum to information and experience exchange on occupational exposure
- Allow vendors to present recent experiences and current technology

- First International ALARA Symposium, Orlando, Florida, March 1997
- First EC/ISOE Workshop on Occupational Exposure Management at Nuclear Power Plants, Malmø, Sweden, September 1998
- Second International ALARA Symposium, Orlando, Florida, January 1999
- Second EC/ISOE Workshop on Occupational Exposure Management at Nuclear Power Plants, Tarragona, Spain, April 2000
- Third International ALARA Symposium, Anaheim, California, February 2001
- Third ISOE European Workshop on Occupational Exposure Management at Nuclear Power Plants, Portoroz, Slovenia, April 2002



Work Management in the Nuclear Power Industry

- Good radiological work management practices
- Publication in English, Chinese, German, Russian and Spanish
- Provides applied information in native languages of nuclear power plant personnel

"The most prominent example of area of improvement is the new approach for dose reduction and dose control that has been introduced in Angra 1 and Angra 2, guided by information from the ISOE System, especially from the report on Work Management in the Nuclear Power Industry..."
Angra nuclear power plant, Brazil

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INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE

Monetary value of collective dose

	Alpha values US$/[man·mSv]			
	Type	Minimum	Average	Maximum
North America (2000)	Single value	500	1300	3300
Europe (1997)	Set of values	17	1000	5300
Non-OECD (1997)	Single value	4	600	1000

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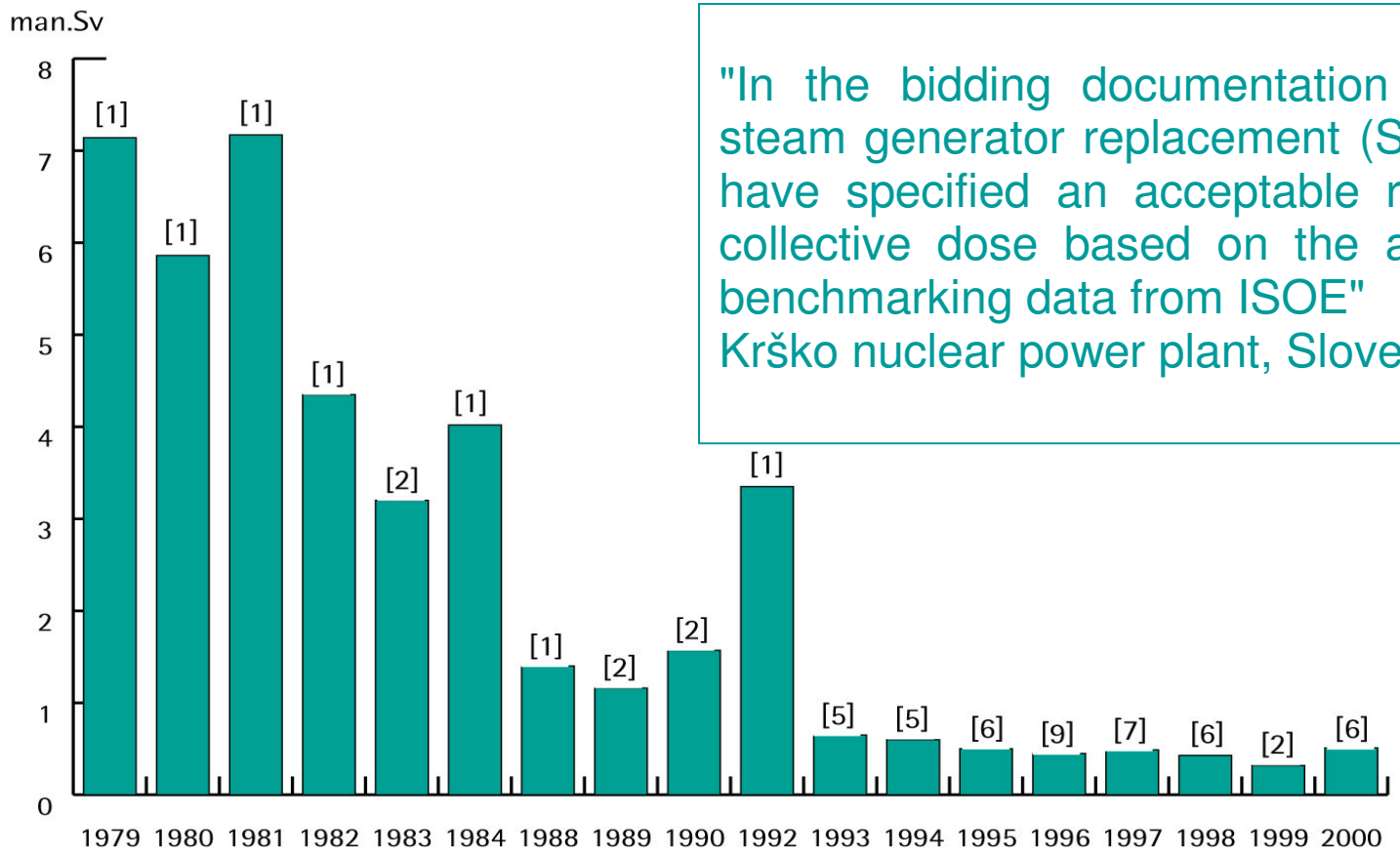
Steam Generator Replacement Average Collective Dose

Evolution of the average collective dose per steam generator replaced

[number of steam generator replacements considered]



"In the bidding documentation for the steam generator replacement (SGR) we have specified an acceptable range of collective dose based on the available benchmarking data from ISOE"
Krško nuclear power plant, Slovenia

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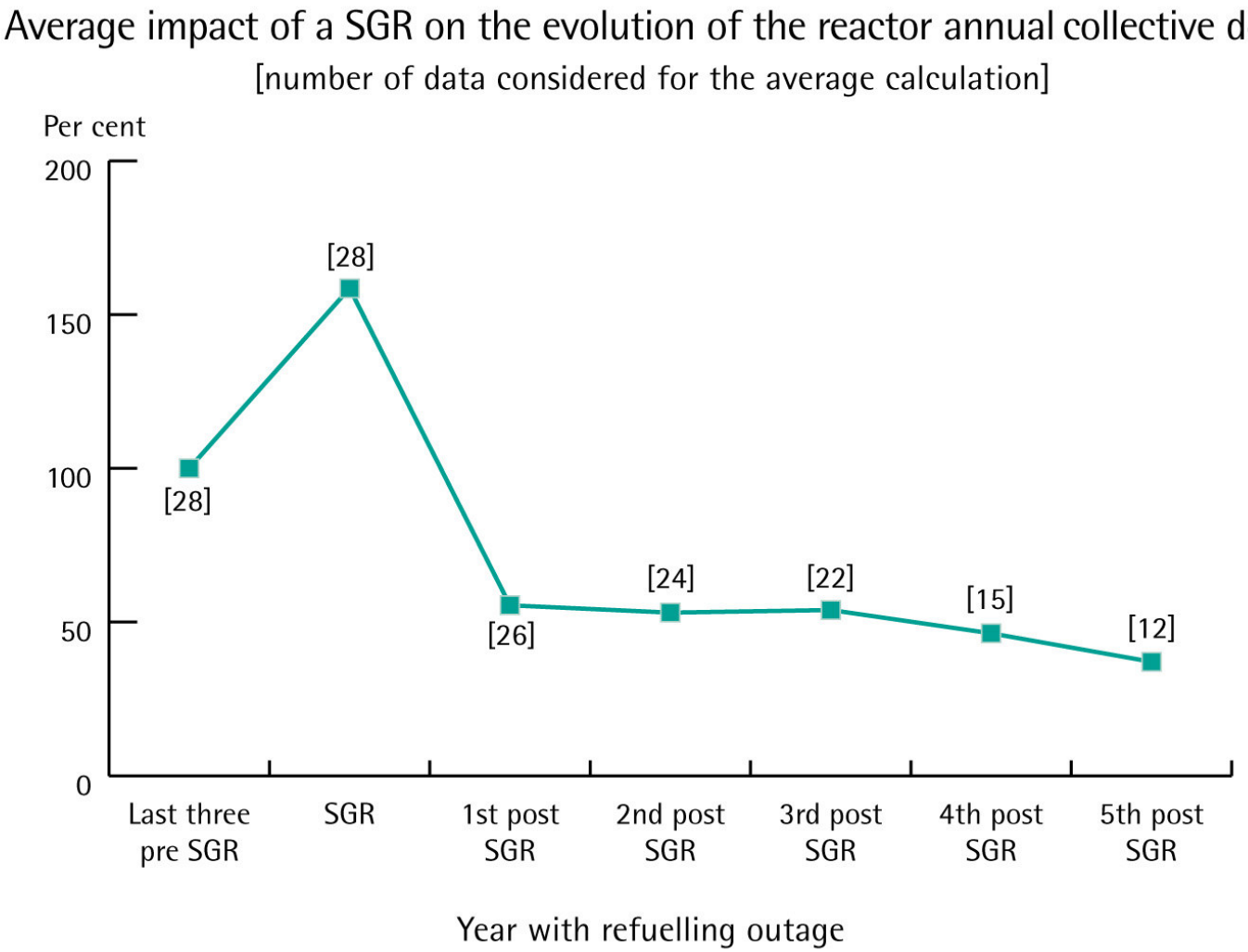
Steam Generator Replacement Evolution of dose



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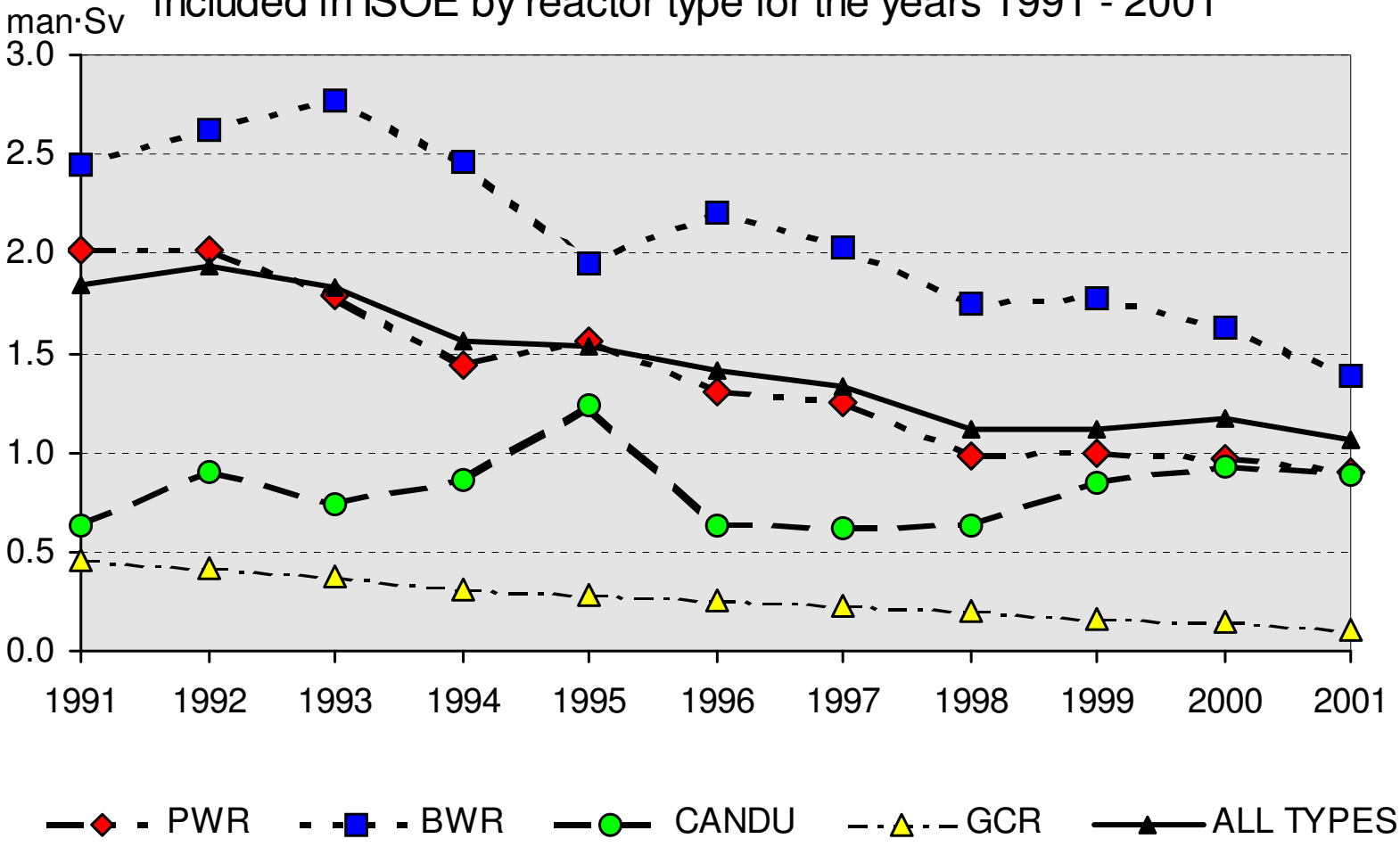
ISOE reveals downward dose trends

Average collective dose per reactor for operating reactors included in ISOE by reactor type for the years 1991 - 2001



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INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE

ISOE Summary

- Information Exchange Network for Radiation Protection Practitioners
  - Operate two tier system (utilities and regulatory authorities)
- World's largest database on Occupational Exposure in Nuclear Power Plants
  - Detailed and up-to date
- Radiation Protection Reporting System for Utilities
  - Experiences, lessons learned, best practices, events,…
  - Easy and rapid distribution

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INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE

Future of the ISOE System

Presentation by

Carl-Göran Lindvall

Barsebäck Nuclear Power Plant, Sweden

Chair of ISOE