ISOE - Information System on Occupational Exposure

Ten Years of Experience

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ISOE Secretariat

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International Atomic Energy Agency

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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.
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
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
<table>
<thead>
<tr>
<th>ISOE Products</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISOE Databases</td>
<td>World’s largest database on occupational exposure data from nuclear power plants</td>
</tr>
<tr>
<td>Annual Reports</td>
<td>Yearly overview of the achievements of the ISOE Programme</td>
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<tr>
<td>Information Sheets</td>
<td>Detailed studies and analyses of ISOE data Information on current issues</td>
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<tr>
<td>Rapid Communication</td>
<td>System for rapid communication of radiation protection information</td>
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<tr>
<td>Workshops and Symposia</td>
<td>International ISOE Workshops on Occupational Exposure Management in NPPs</td>
</tr>
</tbody>
</table>
ISOE Management

ISOE Steering Group
ISOE Bureau

Joint NEA/IAEA Secretariat

Asian Participants
European Participants
Participants from Non OECD Countries
North American Participants

NEA Committee on Radiation Protection and Public Health

Working Group on Data Analysis
Working Group on Operational Radiation Protection

Asian Technical Centre (NUPEC)
European Technical Centre (CEPN)
IAEA Technical Centre (IAEA)
North American Technical Centre (DC Cook)
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
Annual Doses

Annual dose benchmarking for Tricastin 1 between 1990 and 2000

<table>
<thead>
<tr>
<th>Year</th>
<th>Daya Bay 1</th>
<th>Koeberg 2</th>
<th>Tricastin 1</th>
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Refuelling

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

<table>
<thead>
<tr>
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<tr>
<td>2000</td>
<td>47</td>
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</table>
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, Malmö, 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
## Monetary value of collective dose

<table>
<thead>
<tr>
<th>Region</th>
<th>Type</th>
<th>Minimum</th>
<th>Average</th>
<th>Maximum</th>
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<tr>
<td>Europe (1997)</td>
<td>Set of values</td>
<td>17</td>
<td>1000</td>
<td>5300</td>
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<td>Non-OECD (1997)</td>
<td>Single value</td>
<td>4</td>
<td>600</td>
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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
Steam Generator Replacement Evolution of dose

Average impact of a SGR on the evolution of the reactor annual collective dose

[number of data considered for the average calculation]
ISOE reveals downward dose trends

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

- PWR
- BWR
- CANDU
- GCR
- ALL TYPES
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
Future of the ISOE System

Presentation by

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Barsebäck Nuclear Power Plant, Sweden
Chair of ISOE