

IAEA OCCUPATIONAL RADIATION PROTECTION ACTIVITIES OF INTEREST TO ISOE

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- **BACKGROUND**
- **RECENT GUIDES, SAFETY REPORTS & OTHER ACTIVITIES**
- **TECHNICAL CO-OPERATION PROJECTS**
- **INTERNATIONAL CONFERENCE IN GENEVA, AUGUST 2002**

BACKGROUND

T H E I N T E R N A T I O N A L A T O M I C E N E R G Y A G E N C Y



SAFEGUARDS

SAFETY

TECHNOLOGY

IAEA RADIATION SAFETY FUNCTIONS



IAEA FUNCTIONS IN RADIATION SAFETY

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graph TD; A[IAEA FUNCTIONS IN RADIATION SAFETY] -.- B[to facilitate and service international conventions and other undertakings]; A -.- C[to establish standards of radiation safety]; A -.- D[to provide for the application of international standards];
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**to facilitate and service
international conventions
and other undertakings**

**to establish
standards
of radiation safety**

**to provide
for the application
of international standards**

INTERNATIONAL RADIATION SAFETY REGIME

- ✓ **BINDING CONVENTIONS**
- ✓ **INTERNATIONAL STANDARDS**
- ✓ **PROVISIONS FOR APPLICATIONS**

INTERNATIONAL SAFETY REGIME

✓ BINDING CONVENTIONS

✓ INTERNATIONAL STANDARDS

✓ PROVISIONS FOR APPLICATIONS

CONVENTION ON NUCLEAR SAFETY

Article 15. Radiation protection:

.....shall take the appropriate steps to ensure that in all operational states the **radiation exposure to the workers** and the public caused by a nuclear installation shall be kept **as low as reasonably achievable** and that no individual shall be exposed to radiation doses which exceed prescribed national dose limits.

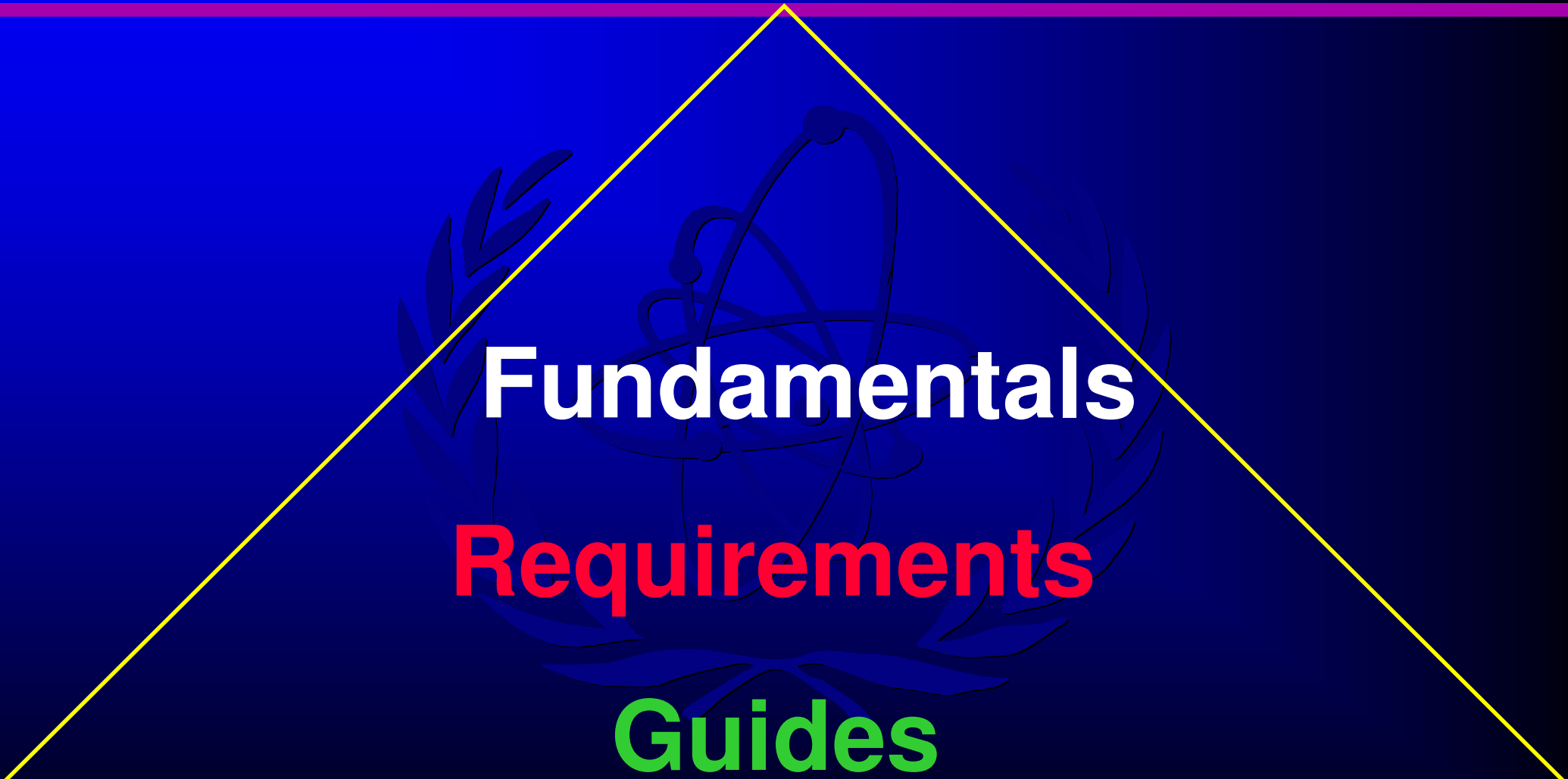
INTERNATIONAL SAFETY REGIME

✓ BINDING CONVENTIONS

✓ INTERNATIONAL STANDARDS

✓ PROVISIONS FOR APPLICATIONS

HIERARCHY OF INTERNATIONAL STANDARDS



Fundamentals
Requirements
Guides

IAEA SAFETY STANDARDS SERIES

Assessment of Occupational Exposure Due to External Sources of Radiation

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SAFETY GUIDE

No. RS-G-1.3



IAEA SAFETY STANDARDS SERIES

Occupational Radiation Protection

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SAFETY GUIDE

No. RS-G-1.1



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VIENNA

IAEA SAFETY STANDARDS SERIES

Assessment of Occupational Exposure Due to Intakes of Radionuclides

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SAFETY GUIDE

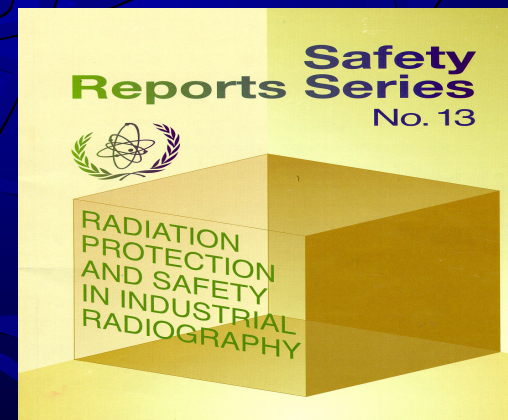
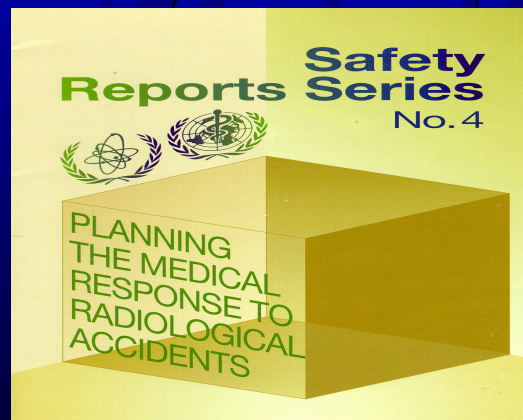
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INTERNATIONAL
ATOMIC ENERGY AGENCY
VIENNA

IAEA SAFETY REPORTS

- **IAEA Safety Reports Series**
 - provide illustrative and technical ways of ensuring safety and fostering information exchange



INTERNATIONAL SAFETY REGIME

✓ BINDING CONVENTIONS

✓ INTERNATIONAL STANDARDS

✓ PROVISIONS FOR APPLICATIONS

APPLICATION of RADIATION SAFETY STANDARDS

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graph TD; A[INTERNATIONAL MECHANISMS FOR APPLYING STANDARDS] --- B[Rendering RADIATION SAFETY SERVICES]; A --- C[Providing TECHNICAL COOPERATION]; A --- D[Fostering INFORMATION EXCHANGE]; A --- E[Promoting EDUCATION & TRAINING]; A --- F[Coordinating RESEARCH & DEVELOPMENT];
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INTERNATIONAL MECHANISMS FOR APPLYING STANDARDS

**Rendering
RADIATION SAFETY
SERVICES**

**Providing
TECHNICAL
COOPERATION**

**Fostering
INFORMATION
EXCHANGE**

**Promoting
EDUCATION
& TRAINING**

**Coordinating
RESEARCH
& DEVELOPMENT**

PROVIDING ASSISTANCE

- > 80 Technical Co-operation Action Plans;
- 80 Country Radiation & Waste Profiles;
- > 30 peer review missions.



RENDERING SERVICES

- Services are available on request;
- Services/Appraisals for Member States.



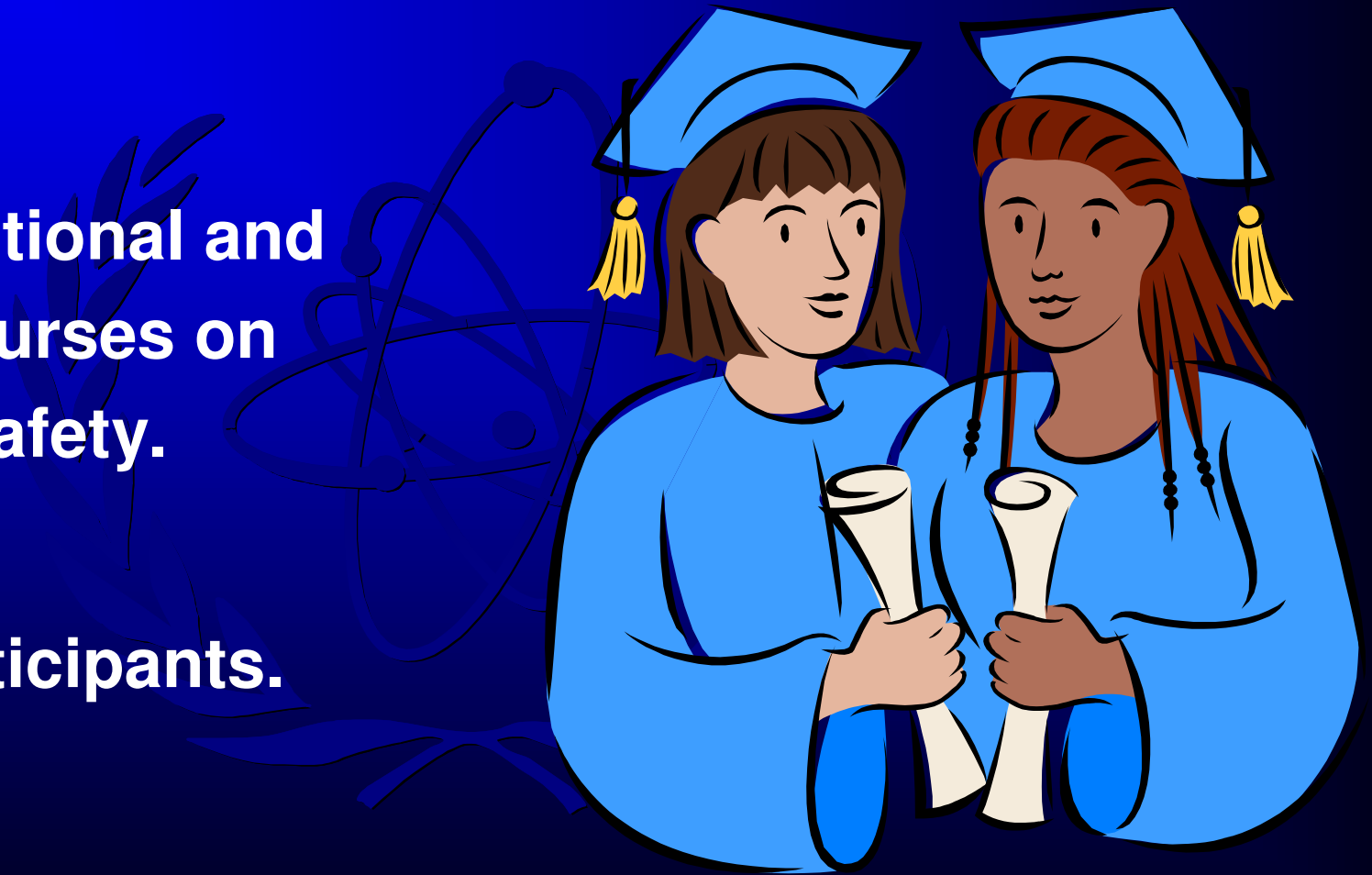
FOSTERING INFORMATION EXCHANGE

- 6 Major meetings; and
- 44 Advisory meetings on the application of radiation safety standards.



PROMOTING EDUCATION AND TRAINING

- > 45 Educational and training courses on radiation safety.
- > 1500 Participants.



SAFETY GUIDES, REPORTS & OTHER ACTIVITIES

SAFETY GUIDES

- **ORPGUIDE**
 - **CD-ROM released end of 2000**
- **Radiation Protection and Radioactive Waste Management in the Operation of Nuclear Power Plants**
 - **Expected to be published in December 2002**
- **Design Aspects of Radiation Protection for Nuclear Power Plants**
 - **Draft to SS Committees in December 2002**

SAFETY REPORTS

- **Optimization of Radiation Protection in the Control of Occupational Exposure**
 - Published early 2002, being translated into all IAEA languages
- **Occupational Protection in the Decommissioning of Nuclear Facilities**
 - Draft available
- **Safety Report on Work Management Issues Related to the Use of Contractors and Itinerant Workers** (advanced draft available)

OTHER ACTIVITIES

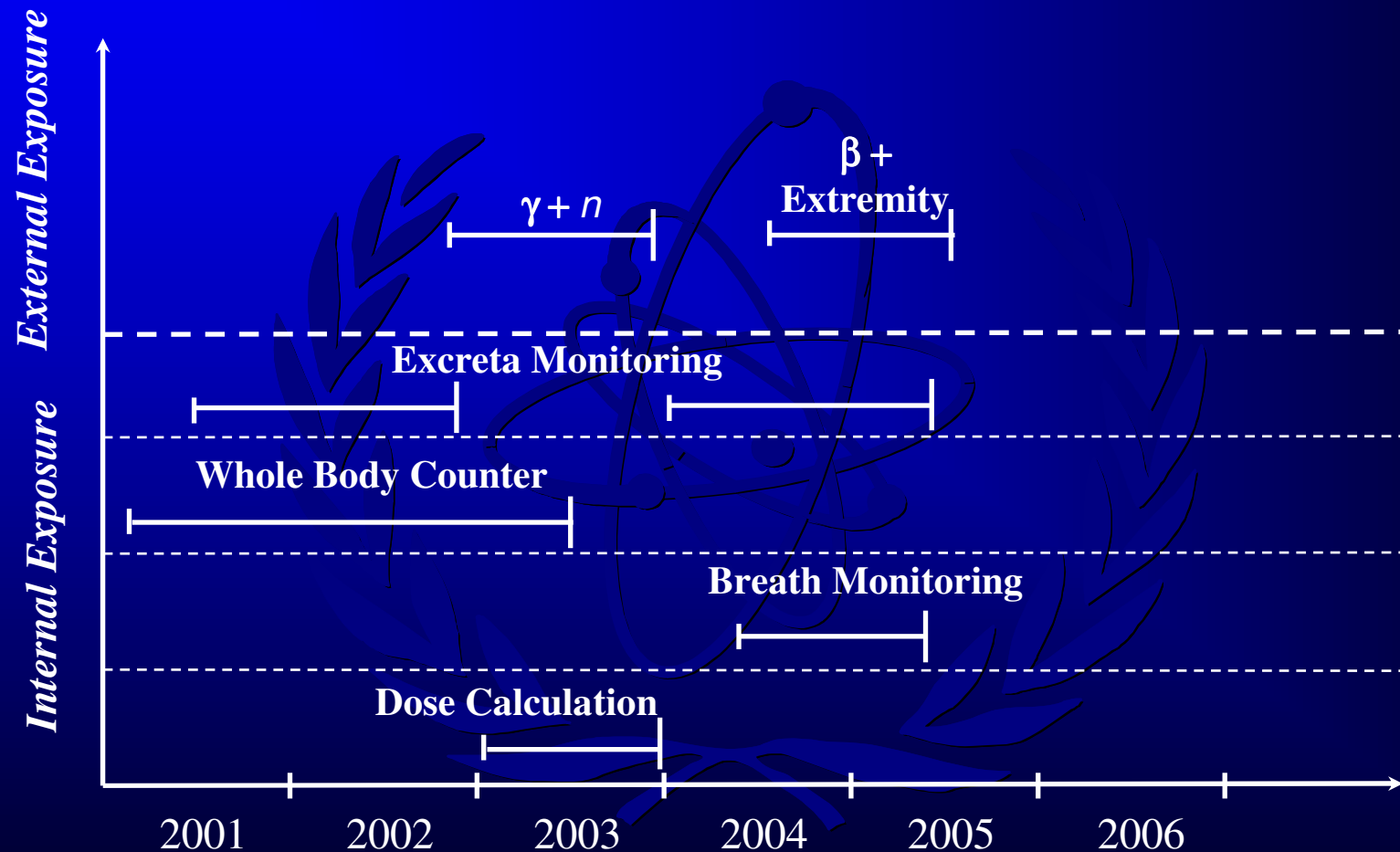
- Development guidance for decision aiding on the probability of causation from occupational exposure
 - Informal IAEA/ILO/WHO meeting held December 2000, TCM planned for 2003
- RADIOR in English on the IAEA Web site
- ALARA training material in English and Russian
 - available on CD-ROM

ALARA COURSES 1 AND 2

Course material on CD-ROM - in English and Russian

- **Slides- PowerPoint file**
- **Lecturers help - Word file**
- **Reference papers - Word files**
- **Reference papers on examples of ALARA implementation - Word files**

Current & Future Activities for Harmonization of Radiological Quantities



ORPAS



OCCUPATIONAL
RADIATION
PROTECTION
APPRAISAL
SERVICE.

OCCUPATIONAL RADIATION PROTECTION APPRAISAL SERVICE: ORPAS

Objectives:

- **Provide objective assessment of the national occupational radiation protection prog.**
- **Identify and disseminate best practices.**
- **Promote self-assessment.**
- **Identify improvements and make recommendations for their implementation.**

The first ORPAS mission - including Krsko NPP - Slovenia in July 2001

TECHNICAL CO-OPERATION PROJECTS

REGIONAL TC PROJECT FOR EUROPE

Enhancing occupational radiation protection in NPPs

- Project will continue in 2003-2004
- New task: Self- assessment of occupational radiation protection in NPPs

Regional TC project for East Asia

Improving occupational radiation protection in NPPs

- ALARA training material available
- ALARA action plan adopted for designated NPPs; results being evaluated
 - recognized good ALARA practices will be disseminated
- Self-assessment will be introduced

MODEL PROJECTS ON UPGRADING RADIATION PROTECTION INFRASTRUCTURE

Countries (since 2001) participating in the Model Project on Upgrading Radiation Protection Infrastructure

Africa	East Asia & the Pacific	West Asia	Latin America	Europe
28	12	11	14	19

AREAS COVERED BY THE MODEL PROJECTS

- Legislation and regulations.
- Regulatory Authority.
- Notification, Authorization and Control.
- Inventory of radiation sources and installations.
- Occupational Exposure Control.
- Medical Exposure Control.
- Public Exposure Control.
- Emergency Preparedness & Response.

STATUS OF IMPLEMENTATION OF MODEL PROJECTS

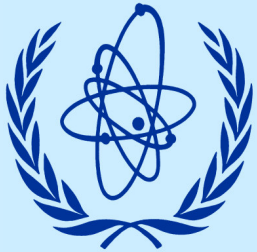
32 peer review missions in 1999-2001:

Status end 2001:

- **80% have an operational national programme for individual monitoring**
- **60% have an operational national programme for workplace monitoring**



INTERNATIONAL CONFERENCE IN 2002



INTERNATIONAL CONFERENCE ON

OCCUPATIONAL RADIATION PROTECTION:

**PROTECTING WORKERS AGAINST EXPOSURE
TO IONIZING RADIATION**

hosted by the Government of Switzerland in Geneva, 26-30 August 2002

PARTICIPATION

- 328 participants
- 72 countries represented
- 33 participants from 12 organizations
- 71 papers presented as posters (out of 122 contributed papers)

TOPICAL SESSIONS

- Radiation risks in the workplace in perspective
- Infrastructure development
- Implementation of Basic Safety Standards
- Monitoring
- ORP in medicine
- ORP in workplaces involving natural radiation
- ORP in industrial and research facilities
- **ORP in nuclear facilities**
- **Probability of causation of occupational harm due to radiation exposure**

ROUND TABLE SESSIONS

- Is the co-operation between regulators, employers and workers achieving optimum ORP?
- Has the continued improvement in radiation protection standards gone far enough in comparison with standards for other hazards?
- Can control of occupational exposure to natural sources be made compatible with controls of occupational exposure to artificial radiation?

ROUND TABLE SESSIONS (CONT'D)

- What are the main problems in operational implementation of radiation protection standards?
- Is there a need for a major change in ICRP recommendations involving occupational exposure?

OCCUPATIONAL EXPOSURE IN PERSPECTIVE

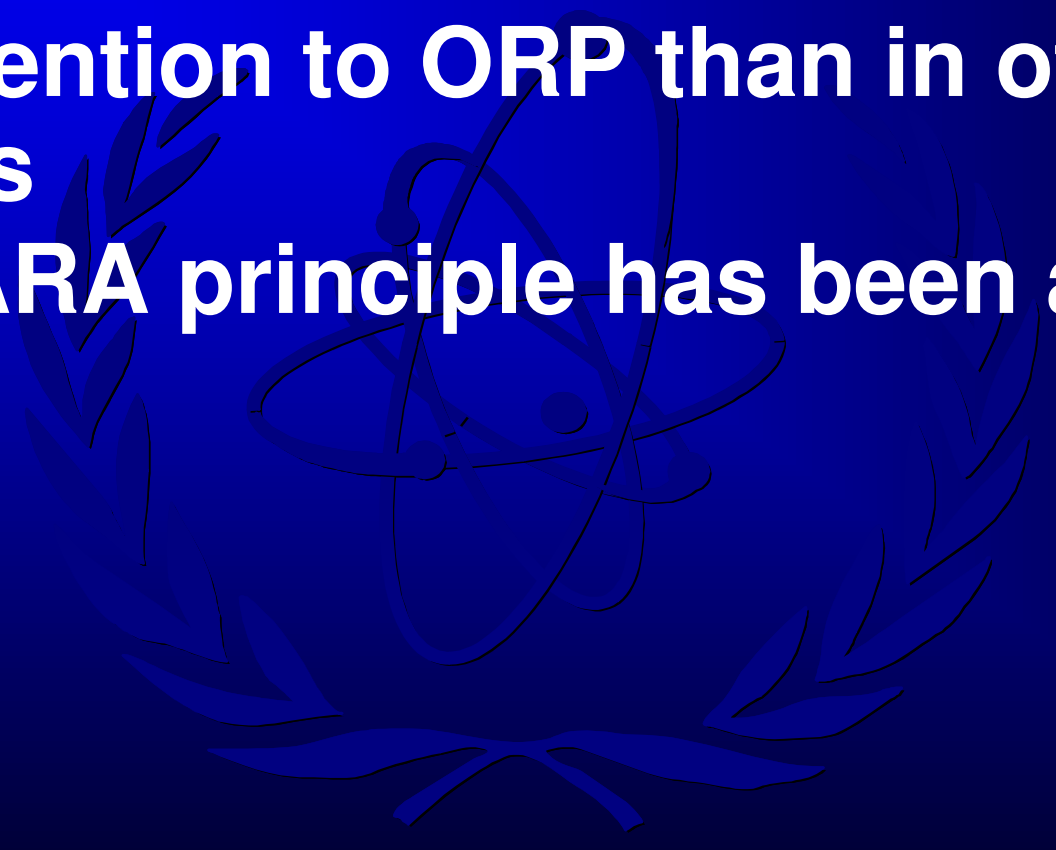
- UNSCEAR underestimates the number of exposed workers
 - 10 million underground workers in China
- International standards are satisfactory
- Risks are comparable to those from other occupational hazards
- **Optimization should be supported, e.g through ALARA Networks**
- Focus on higher individual doses, above ~ 2 mSv/a
- Objectives of optimization are related to local circumstances

IMPLEMENTATION OF BASIC SAFETY STANDARDS

- The IAEA Model Project is a good example of international co-operation
- ALARA Networks useful
- Identify workers likely to be subject to higher exposures
- Female workers: chronic intake may pose a risk to embryo/foetus
- Update ILO Convention 115
- Integrate ORP with other health and safety measures

NUCLEAR FACILITIES

- More attention to ORP than in other practices
- The ALARA principle has been applied



NUCLEAR FACILITIES (cont'd)

- Future concerns
 - High individual doses
 - Itinerant workers and contractors
 - More involvement of the workers
 - ◆ Time, distance, shielding, **awareness**
 - Optimization in decommissioning and in old facilities
 - Maintaining competence

MONITORING OF OCCUPATIONAL RADIATION EXPOSURES

- Individual monitoring for neutron, beta and internal exposure is still a challenge
- Optimization of monitoring practices is another concern
- Standardization of data formats for recording and reporting is required

MONITORING OF OCCUPATIONAL RADIATION EXPOSURES (cont'd)

- **Some countries have not updated their regulations based on the recent International BSS; different quantities and non SI units are hindering the international communication**

PROBABILITY OF CAUSATION OF OCCUPATIONAL HARM

- **Occupationally exposed workers will develop cancer**
- **Some countries use schemes for compensation**
- **Compensation schemes should be scientifically and evidence based**

PROBABILITY OF CAUSATION OF OCCUPATIONAL HARM (cont'd)

- Dose reconstruction is an essential component
- Stakeholder involvement is strongly desirable
- International co-operation is needed to develop guidance

IS A MAJOR CHANGE IN ICRP RECOMMENDATIONS NEEDED?

- For occupational exposure major changes do not seem necessary.
 - Attention should be given to the most exposed workers
 - ◆ Worldwide agreed standard level of protection needed
 - ◆ Optimization is the main tool
 - Exposure to natural radiation deserves attention
 - ◆ Define amenability to control
 - Clarification of terminology necessary, particularly with regard to detriment

OVERALL OUTPUTS

- **Participants highly appreciated the Conference**
 - **Holistic approach to ORP**
 - **“Intelligent” discussions**
 - ◆ Developing and developed countries participated
 - ◆ Different stakeholders presented their views
- **Nine specific recommendations for action**
- **GC – formulate an International Action Plan in co-operation with ILO and other relevant bodies**

IMPACT ON FUTURE PROGRAMME

- Harmonize terminologies and interpretations of requirements, incl. ILO Convention 115
- Collaborate closely with ILO
- **Widen ISOE - ALARA Networks**
- **Produce training packages**
- **Disseminate lessons learned**
- Develop guidance on natural radiation
- **Develop guidance on probability of causation**



Further information

<http://www.iaea.org/ns/rasanet/>



Thank you!