

**IAEA OCCUPATIONAL RADIATION
PROTECTION ACTIVITIES OF INTEREST
TO
ISOE**

**2003 International ISOE ALARA Symposium
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Orlando, Florida**

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Division of Radiation and Waste Safety
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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.

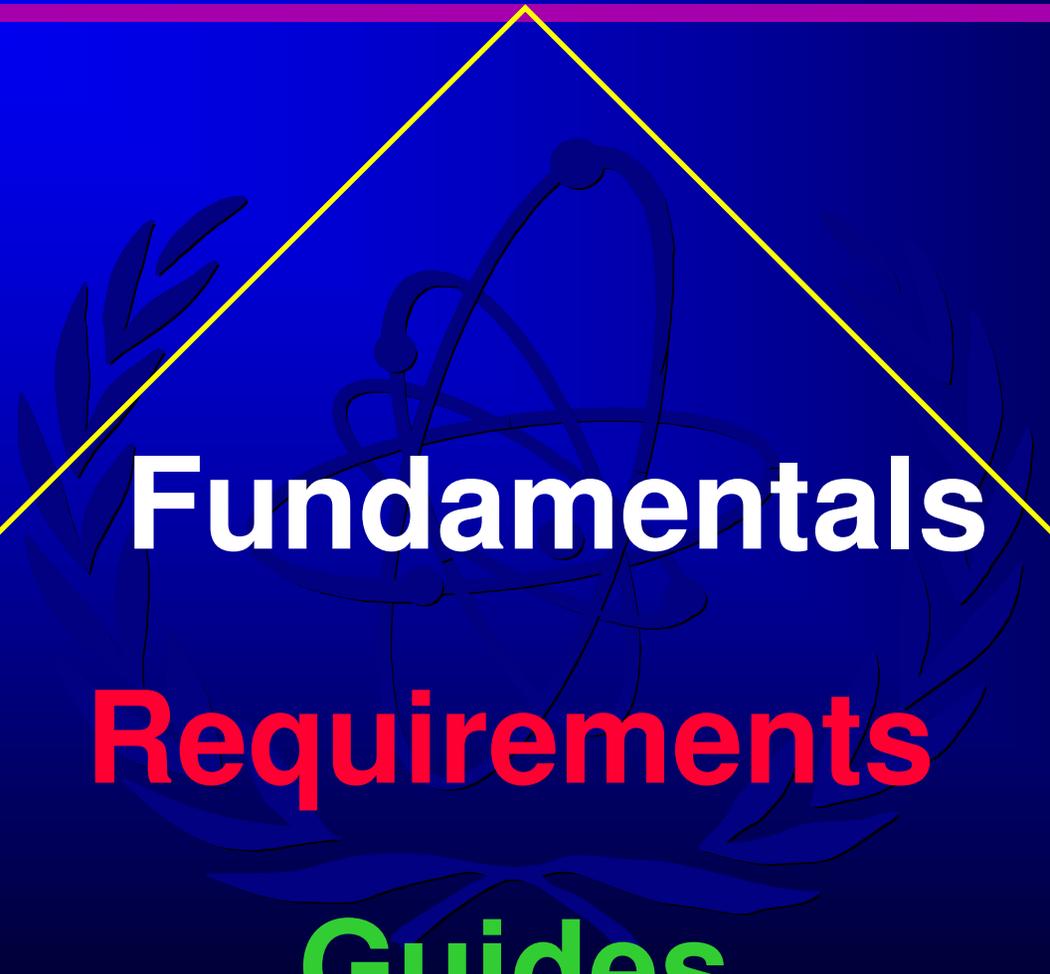
INTERNATIONAL SAFETY REGIME

✓ 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



INTERNATIONAL
ATOMIC ENERGY AGENCY
VIENNA

IAEA
SAFETY
STANDARDS
SERIES

Occupational Radiation
Protection

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SAFETY GUIDE

No. RS-G-1.1



INTERNATIONAL
ATOMIC ENERGY AGENCY
VIENNA

IAEA
SAFETY
STANDARDS
SERIES

Assessment of
Occupational Exposure
Due to Intakes of
Radionuclides

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SAFETY GUIDE

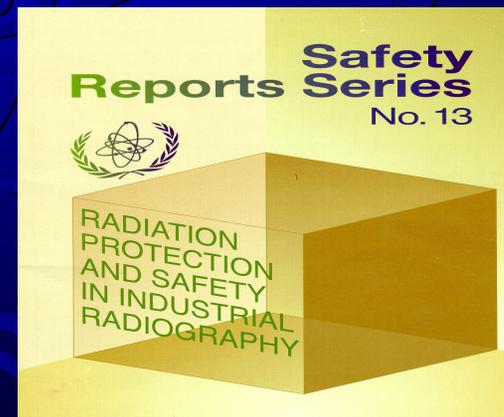
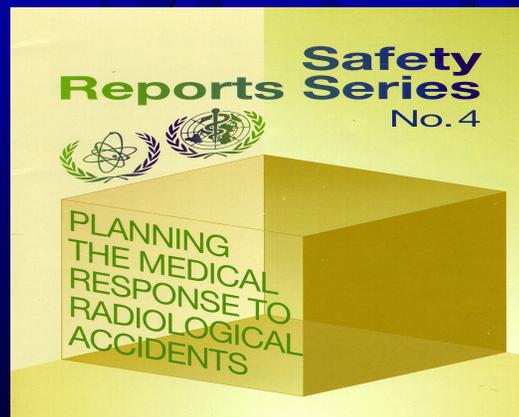
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INTERNATIONAL
ATOMIC ENERGY AGENCY
VIENNA

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

**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.**



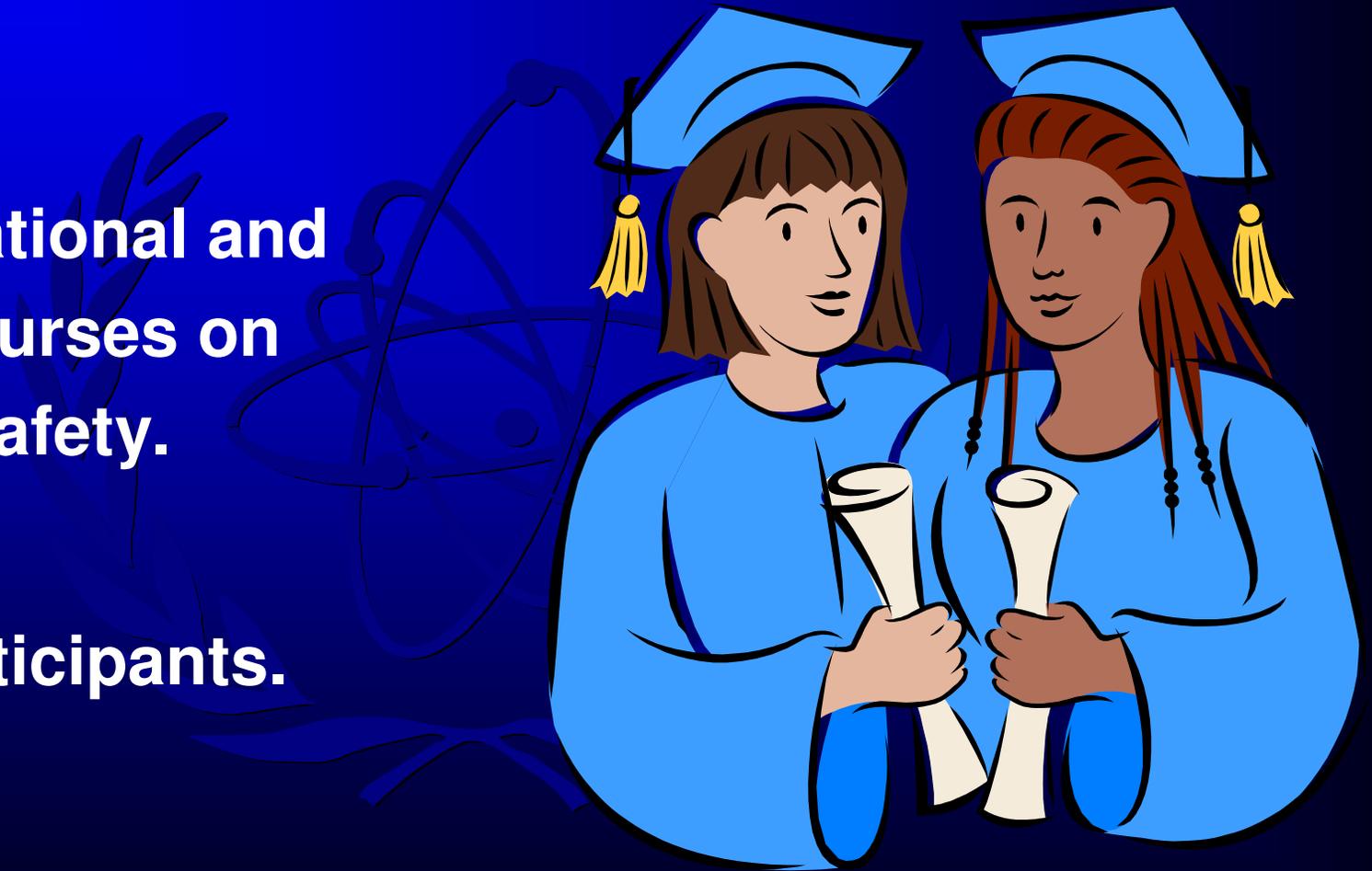
FOSTERING INFORMATION EXCHANGE

- 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

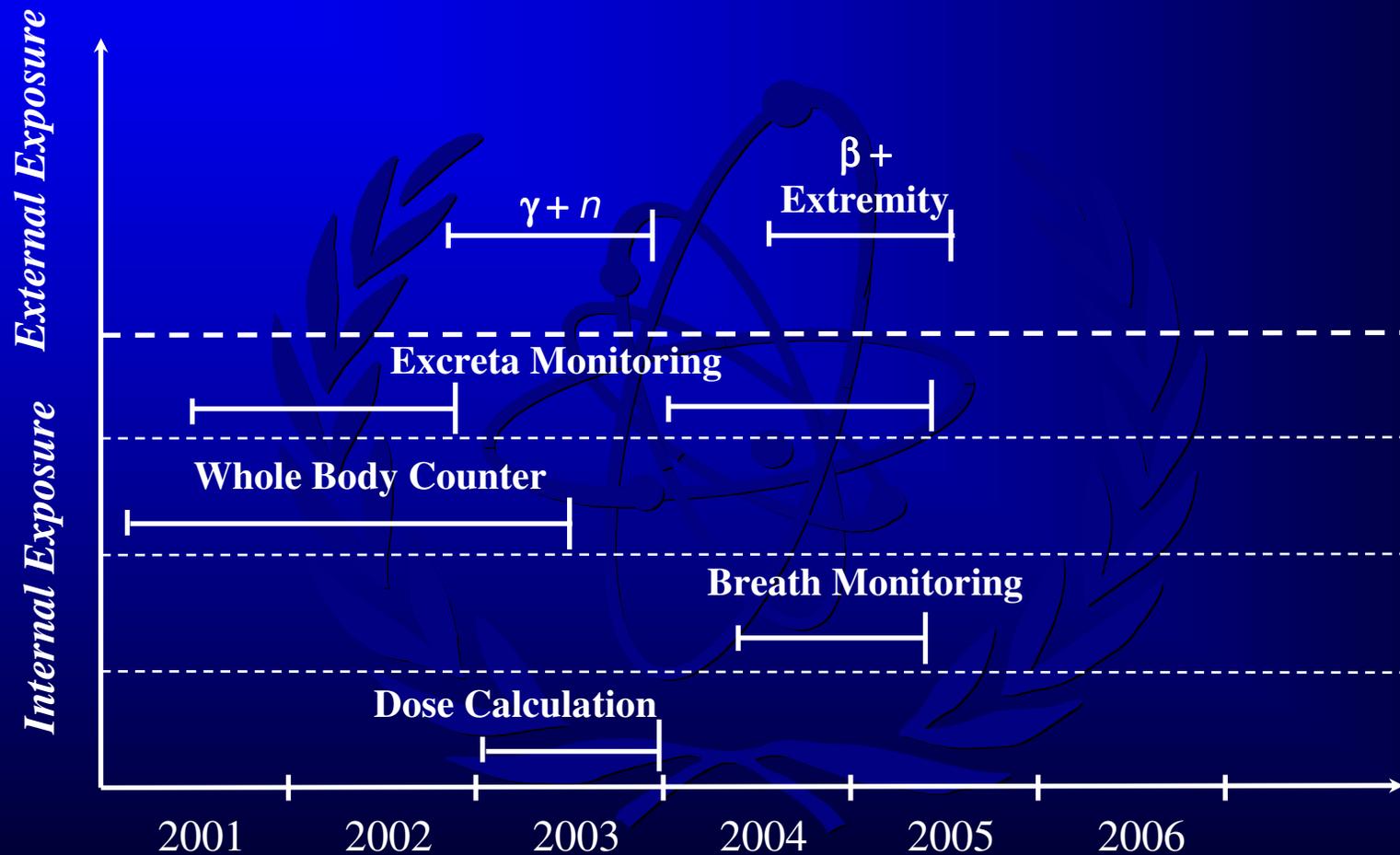
- **Development guidance for decision aiding on the probability of causation from occupational exposure**
 - **Informal IAEA/ILO/WHO meeting held December 2000, TCM planned for 2003**
- **RADIOR in English on the IAEA Web site**
- **ALARA training material in English and Russian**
 - **available on CD-ROM**

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.**

STAUS OF IMPLEMENTATION OF MODEL PROJECTS

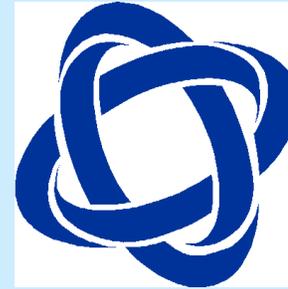
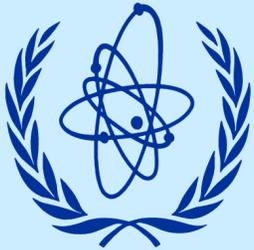
32 peer review missions in 1999-2001:

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!