Radiological Protection in Nuclear Accident and Radiological Emergencies

Recommendations and Activities of ICRP

IFRC Reference Group Meeting
Fukushima View Hotel – 30 October 2014

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ICRP Committee 1

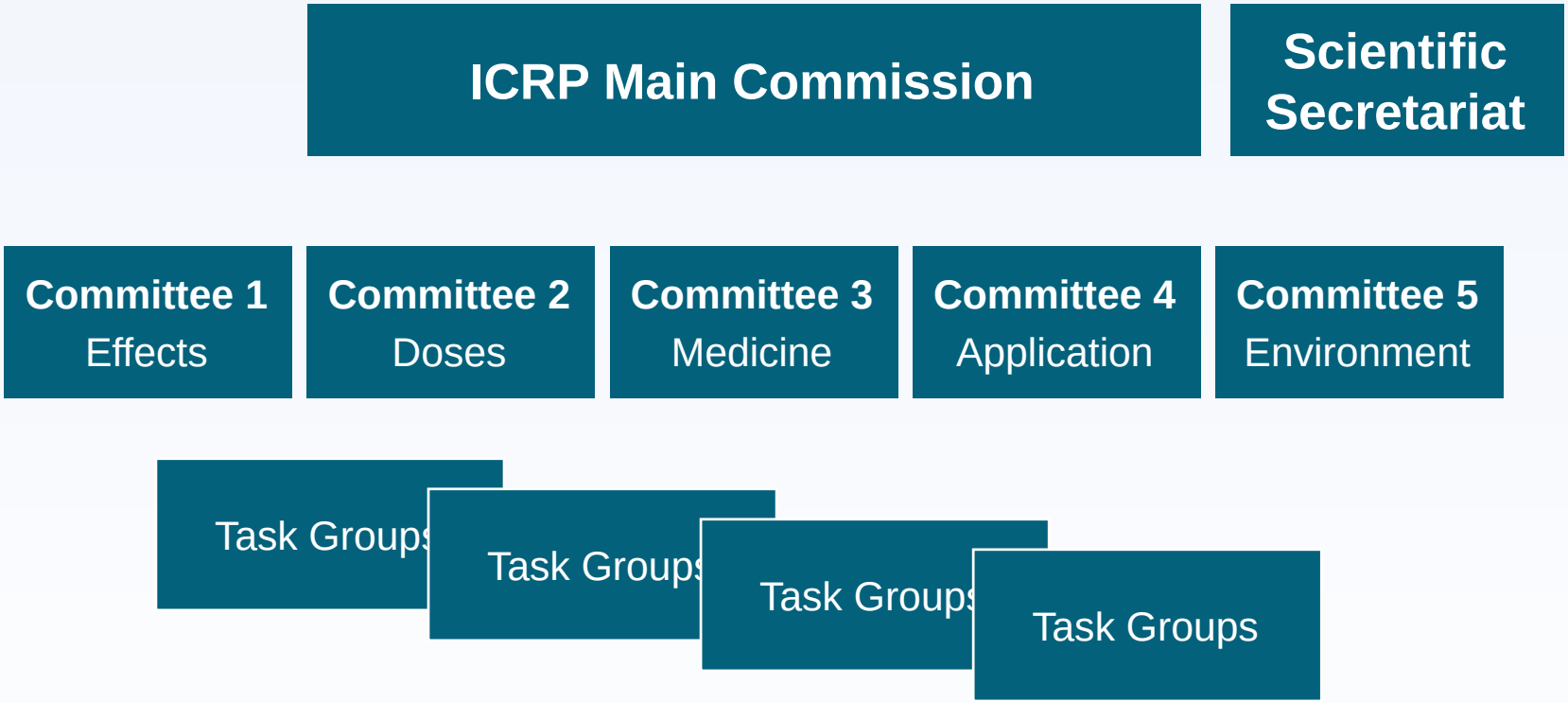
Contents

- **What is ICRP?**
- **ICRP Recommendations**
- **ICRP Dialogue Seminar**

History of ICRP

- International X-Ray and Radium Protection Committee (IXRPC) was established in 1928 by the International Congress of Radiology.
- IXRPC was restructured and renamed as International Commission on Radiological Protection (ICRP) in 1950.
- ICRP provides recommendations and guidance on protection against ionising radiation.

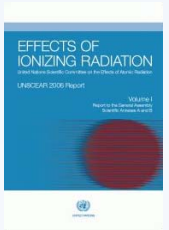
ICRP Structure



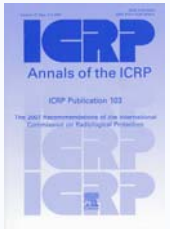
An independent, international community of experts in radiological protection

Nearly 250 experts in radiological protection science and policy
from 32 countries and six continents

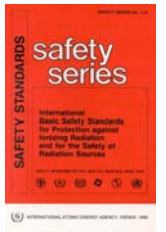
Roles of Organisations

UNSCEAR — Doses and Effects → 

Scientific Evidence

ICRP — Philosophy and Policy → 

Paradigm

IAEA — Regulatory Practicalities → 

Standards

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- **What is ICRP?**
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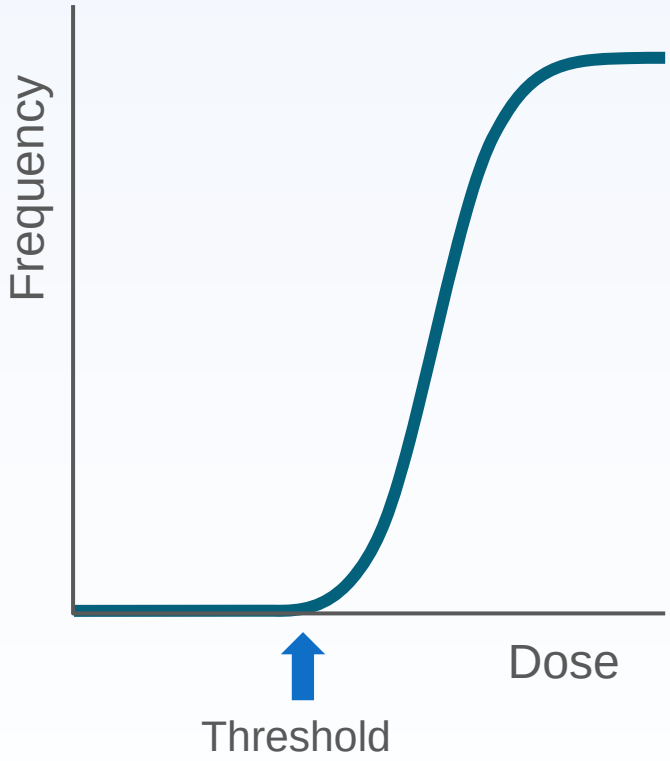
Aim of ICRP Recommendations

*To contribute to an **appropriate level of protection for people and the environment** against the detrimental effects of radiation exposure without unduly limiting the desirable human actions that may be associated with such exposure*

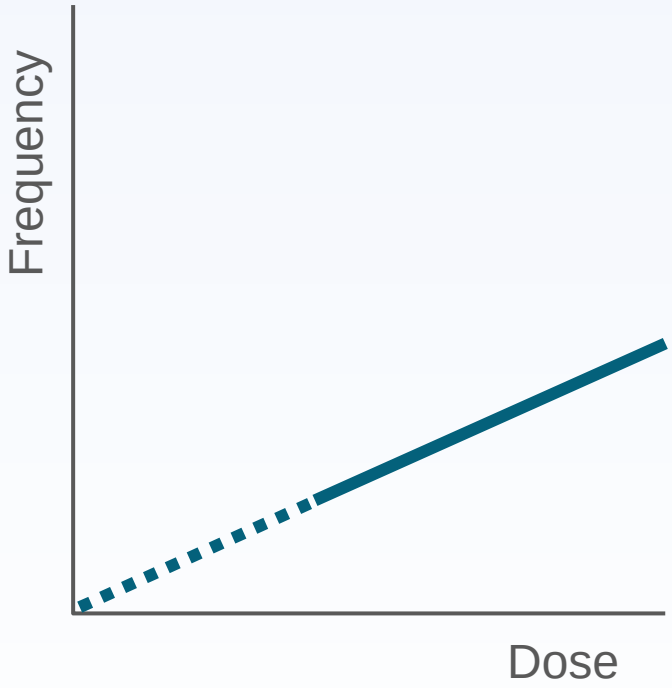
(ICRP Publication 103)

Health Effects of Radiation

Deterministic Effects



Stochastic Effects



Protection of Human Health

Manage and control exposures so that:

- Deterministic effects (harmful tissue reactions) are **prevented**
- The **risks** of stochastic effects (cancer or heritable effects) are **reduced** to the extent reasonably achievable

Principles of Protection

- **Justification**

  Any decision that alters the radiation exposure situation should do more good than harm.

- **Optimisation**

  The likelihood of incurring exposures, the number of people exposed, and the magnitude of their individual doses should all be kept as low as reasonably achievable, taking into account economic and societal factors.

- **Dose Limitation**

  The total dose to any individual from regulated sources in planned exposure situations other than medical exposure of patients should not exceed dose limits.

Dose Limits

Part of Body	Occupational	Public
Effective Dose (Whole Body)	20 mSv/a averaged over 5 years 50 mSv/a	1 mSv/a
Lens of the Eye	20 mSv/a averaged over 5 years 50 mSv/a	15 mSv/a
Skin	500 mSv/a	50 mSv/a
Hands and Feet	500 mSv/a	–

Exposure Situations

- **Planned Exposure Situation**

  involves the deliberate introduction and operation of sources

- **Emergency Exposure Situation**

  is unexpected and requires urgent action

- **Existing Exposure Situation**

  already exists when a decision on control has to be taken, including prolonged exposure situations after emergencies

Dose limits apply only to planned exposure situations

Protection of Emergency Workers

Category 1: Urgent action at the site

- Doses may voluntarily exceed limits for planned exposure situations
- Make every effort to keep doses < 1 Sv
  (Higher exposure may be justified for life-saving actions)

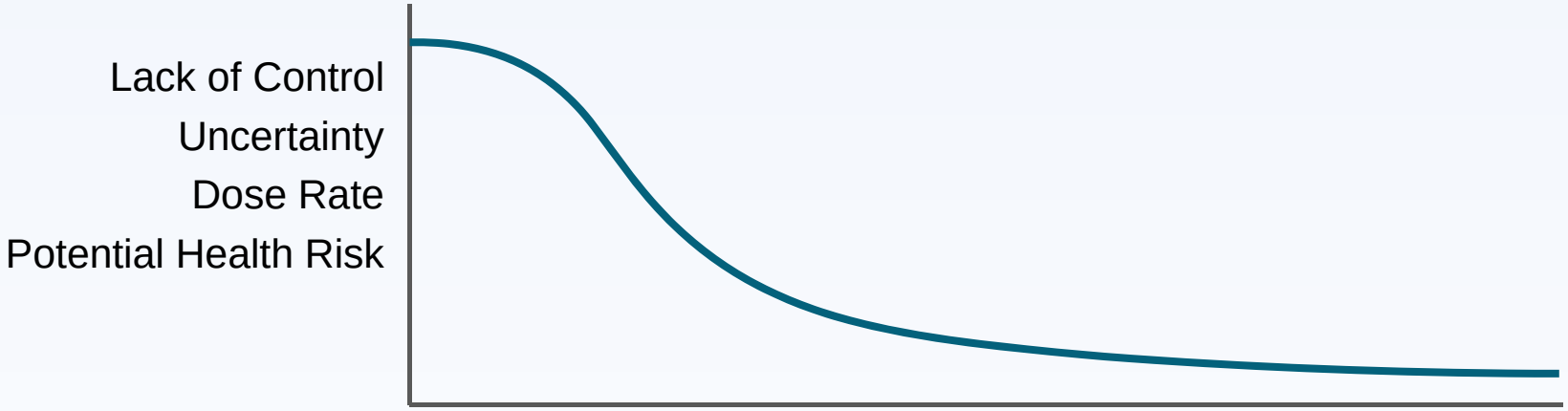
Category 2: Early protective actions, action to protect public

- Protection consistent with the system for planned exposure situations, where feasible

Category 3: Recovery operations

- Subject to the system for occupational exposure in planned exposure situations

Evolution of Situations after the Accident



Exposure Situation	Emergency	Existing
Reference Level	20–100 mSv	1–20 mSv/a

In the Case of Fukushima

- **December 2011**

  Announcement of the stabilisation of the reactors

- **January 2012**

  Launching of the decontamination programme

- **April 2012**

  New regulation on contamination food and rearrangement of the restricted areas

From early 2012 the situation can be considered as an existing exposure situation.

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Key Concepts in the Recovery phase

- **Human Dimension**
- **Self-help Protection**
- **Radiation Protection Culture**
- **Stakeholder Engagement**

Stakeholder Engagement

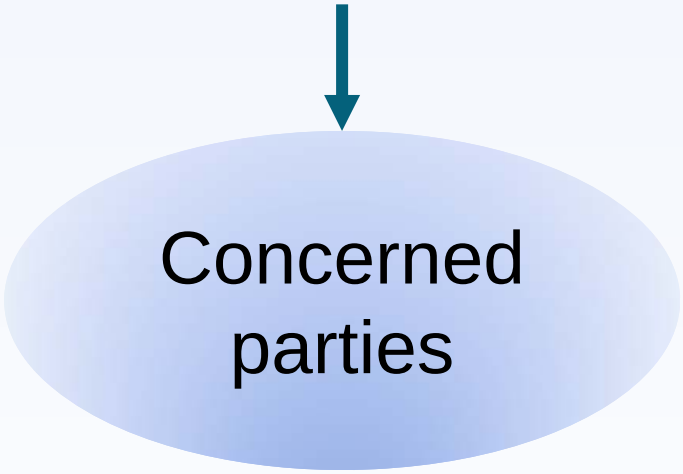
Authorities should facilitate the setting-up of local forums involving representatives of the affected population and relevant experts.

Such engagement (stakeholder engagement) is considered by the Commission to be key to the development and implementation of radiological protection strategies for most existing exposure situations.

(ICRP Publication 111)

Setting Up a Forum for Dialogue

ICRP + Radiation Safety Forum Japan



ICRP Dialogue Seminar

Rehabilitation of living conditions after the Fukushima accident: Lessons from Chernobyl and ICRP recommendations

Participating Parties

- Local people
- Farm producers
- Authorities
- Distributors
- Consumers
- School teachers
- NPO
- Local media
- Experts
- Professionals
- Foreign rep
- ICRP

History

	Date	Place	Main subject
1	Nov 2011	Fukushima City	Problems in general
2	Feb 2012	Date City	Problems in Date
3	Jul 2012	Date City	Food production, distribution
4	Nov 2012	Date City	Education at school
5	Mar 2013	Date City	Returning (staying) or not
6	Jul 2013	Fukushima City	Problems in Iitate
7	Nov-Dec 2013	Iwaki City	Challenges in Iwaki
8	May 2014	Minami-soma City	Problems in Minami-soma
9	Aug 2014	Date City	Raising children

6th Dialogue
(Fukushima City)

7th Dialogue
(Iwaki City)

Form of Meeting

Format

- Two-day programme
- Language: Japanese and English
- Facilitator: Jacques Lochard (ICRP Vice-Chair)

Program

- Self-introduction
- Presentations
- Dialogue
- Rapporteur’s report and discussion

Benefits of Dialogue

- Emphasised human dimension
- Involved diverse parties
- Helped share the experience
- Promoted understanding of the situation
- Facilitated mutual understanding and co-expertise
- Encouraged self-help activities based on measurements