International Experts Meeting on

Decommissioning and Remediation After a Nuclear Accident

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Session VI-A
Decommissioning and Remediation Standards and their Application
Summary of Findings and Recommendations

Co-Chairs: Christopher Clement (ICRP) and Thomas Kirchner (EC)

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Session VI-A, Decommissioning and Remediation Standards and their Application

Japan: Standards for remediation

H. Nishiyama, Ministry of the Environment, Japan

Understanding the long-term implications of severe radiological accidents (including Infrastructure and resource needs)

W. Weiss, UNSCEAR

Lessons from the clean-up of bulk contaminated soil at the Maralinga test site

G. Williams, ARPANSA

The international safety regime for the decommissioning and remediation after a nuclear accident: lessons from Fukushima

A.J. González, Autoridad Regulatoria Nuclear

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Remediation (1)

Remediation includes any measures … to reduce the radiation exposure due to existing contamination of land areas through actions applied

- to the contamination itself (the source) or
- to the exposure pathways to humans

IAEA Safety Standards GSR Part 3

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3

Remediation (2)

- Should be able to resolve unambiguously
  - Is it safe to live here?
  - Can the children play outside?
  - Is it safe to eat this food?
- If the current international regime cannot answer these questions something is wrong

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4

First Priority of Remediation

- The first priority is to protect people with the highest exposures, in parallel reducing all individual exposures to as low as reasonably achievable
- This implies assessments of the dose distribution, comparison of doses with the reference level, and optimisation of protection

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5

Justification and Optimisation

During remediation, justification and optimisation must be applied to ensure actions balance:

- **objective** elements (exposure, costs, etc.)
- **subjective** elements (public perception, anxiety, political pressure, etc.)

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6

Standards used in Japan: Remediation

- Follows recommendations of ICRP
- **Areas < 20 mSv/y**, two-year target to reduce doses of residents by 50% (60% for children)
- Long-term goal additional dose of 1 mSv/y or less
- **Areas 20-50 mSv/y**, reduce doses to < 20 mSv/y by March 2014
- **Areas > 50 mSv/y**, model projects
- Review strategy after 2 years

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Standards used in Japan: Waste

- Combustible decommissioning wastes will be incinerated
- Ash < 8 000 Bq/kg disposed by local gov't
- Ash > 8 000 Bq/kg disposed by national gov't
- Ash > 100 000 Bq/kg and all soil sent to interim storage facility

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Standards used in Japan: Workers

- Decontamination worker maximum allowed dose 100 mSv in 5 years, and 50 mSv/y
  - Female workers 5 mSv quarterly
  - Pregnant workers 1 mSv for duration of pregnancy
- Work in areas > 2.5 µSv/h requires stricter oversight e.g.
  - Respiratory protection
  - Internal exposure assessment
  - Formal work plan
  - Reports to Labour Standards Supervising Bureau

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Maralinga: Application of Standards

- Every remediation project is different
- Focus on fixing possibilities for giving very high doses
- Need vision of future, looking beyond present land use and societal values
- Stakeholder consultation and feedback build trust and confidence
- Need efficient, effective, and cooperative regulatory processes (regulation probably can't speed up remediation, but can slow it down!)
- Break remediation down into manageable bits

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Maralinga: Criteria & Stakeholders

- Maralinga criteria
  - Based on 5 mSv/y for 100% occupancy
  - Result unlikely to exceed 1 mSv/y
- Consultation with local stakeholders resulted in a balance between disruptive cleanup and results acceptable to the local population

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11

Numerical vs Descriptive Standards

- Balance between **numerical** and **descriptive** standards
- Linked to differences in “technical” approach and “social” approach
- Numerical basis may be necessary, with descriptive language on implementation
- Firm numerical standards may not always result in an optimal solution

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12

Criteria for Commodities

- There are inconsistencies in international standards for consumer products

GC(44)/RES/15, September 2000

RADIOLOGICAL CRITERIA FOR LONG-LIVED RADIONUCLIDES IN COMMODITIES (ESPECIALLY FOODSTUFFS AND WOOD)

"develop…radiological criteria for long-lived radionuclides in commodities, particularly foodstuffs and wood"

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13

Psychosocial Health Impacts

- Remediation must address health, environmental, economic, social, psychological, cultural, ethical, political, etc.
- WHO's definition of health: *"A state of complete physical, mental and social well-being, and not merely the absence of disease"*

- Is consideration of psychosocial impacts within IAEA mandate?
- What about other international organisations (WHO?, ICRP?, …)
- How can/should these impacts be considered in planning and implementing remediation?
- How to handle difficulties separating impacts from NPP accident and broader "disaster"?

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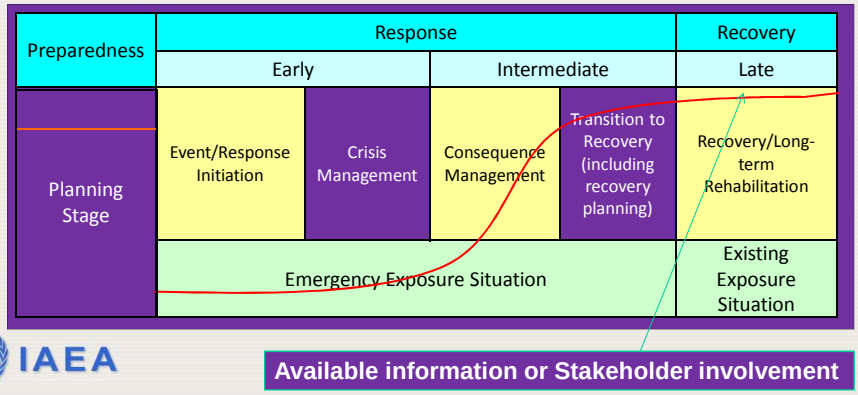
14

Transition from Emergency to Existing Exposure Situation

- Policy level is reasonably firm
- Need for additional implementation guidance with technical basis



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15

What is Safe?

- Is it possible to agree on what is 'safe'?
  - 'Safe enough' vs 'perfectly safe'
- Would benefits of agreeing on a universal level of 'safe' exposure outweigh disadvantages and limitations?

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16

Other Issues

- Current waste standards not always a good fit for post-accident remediation wastes
- Gap between ‘scientific’ guidance and actual policy (created by ‘misuse’ of LNT?)
- Need for technical guidance on moving from generic reference levels to DRLs

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17