4th NERIS Workshop

« Decision-making processes in post-accidental situation: manifestation of uncertainty »

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EJP-CONCERT

European Joint Programme for the Integration of Radiation Protection Research

H2020 – 662287

D 9.65 – Decision processes/pathways

TERRITORIES: Synthesis report of CONCERT sub-subtask 9.3.3.1

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25 April 2018, Dublin

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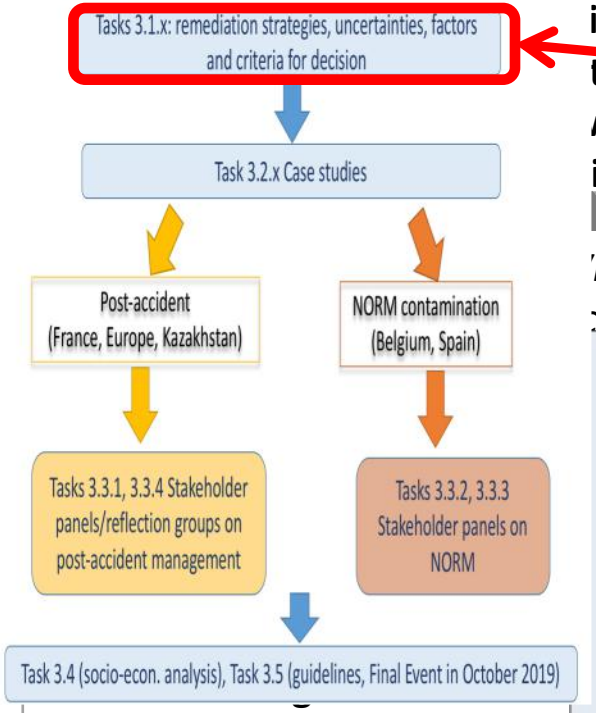
EUROPEAN JOINT PROGRAMME FOR THE INTEGRATION OF RADIATION PROTECTION RESEARCH

CONCERT TERRITORIES

Sources of uncertainty



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TERRITORIES

Integrated and graded framework for risk assessment and management

WP3- Stakeholder engagement for a better management of uncertainty in risk assessment and decision-making processes including remediation strategies

P4 will consolidate and
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You are here

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Objective of the deliverable/Methodology

Analyse how uncertainty impacts decision-making for existing exposure situations (NORM & PA)

- Identify the decision factors and criteria (including dose criteria), used in existing exposure situations management frameworks and processes
- Evaluate their potential impacts on the life of affected people and/or the state/quality of the environment acceptable or suitable for its next use.

Collect and update information on remediation strategies applied to reduce the consequences in long-lasting radiological exposure situations.

- Determine key parameters, objectives and decision pathways of remediation processes that mitigate environmental contamination and dose to humans and wildlife, waste management and land use options, socio-economic criteria, ….
- Identify in which decision areas, and for which potential decision factors and criteria, uncertainties are the most questionable by the different stakeholders and how important the impact of these uncertainties could be in the decision-making processes.

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Content of the Deliverable

INTRODUCTION

PART 1: REVIEW OF LITERATURE FROM INTERNATIONAL, EUROPEAN

1. POST-ACCIDENT SITUATIONS
2. CONTAMINATION WITH NATURAL RADIONUCLIDES

PART 2: INSIGHTS ON PAST EXPERIENCES OF POST-NUCLEAR ACCIDE RELATED UNCERTAINTIES

1. FEEDBACKS FROM PAST EXPERIENCES
2. Manifestation of uncertainty in post-accidental context

PART 3. INSIGHTS ON NORM CONTAMINATION SITUATIONS AND AN UNCERTAINTIES

PART 4: TRANSVERSAL ISSUES: UNCERTAINTY MANAGEMENT IN TH EXPOSURE SITUATIONS

PART 5: PRELIMINARY UNDERSTANDING OF THE WAY THE MANAGEM INTO PLAY WITHIN THE OVERALL MANAGEMENT OF EXISTING EXPOSURE SITUATION

- **7 differents teams:** CIEMAT, SCKCEN, CEPN, MUTADIS, NRPA, Univ-Tartu, IRSN….
- **Multi disciplinary skills**: social sciences, radioprotection, radioecology, metrology….

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INTRODUCTION

- **Existing exposure situations: result from sources that already exists and where a decision to control needs to be made**
  - Post-accident rehabilitation situations and exposures from natural sources are considered as existing exposure situations
- **Wide range of stakeholders are involved** (local communities, public, authorities, experts, etc.)
- **Uncertainties: refer to any situation for which a fact/data/phenomenon or their causes or consequences are not known with certainty by a specific actor in her/his decision context ;** embracing many aspects: social, economic, environmental, health, etc.

Management of existing exposure situations clearly raise various uncertainties

Exposure scenarios, radiological impact assessments, reactions of affected population, future of the territories..

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MANIFESTATION OF UNCERTAINTY IN POST-ACCIDENTAL CONTEXT

Feedback from past experiences

- Illustrations from post-Chernobyl situation
- Illustrations from post-Fukushima situation
- Kazakhstan case study – Semipalatinsk Test site

Uncertainties identify

Uncertainties related to the radiological characterization and impact assessment

Zoning the affected areas

Feasibility and effectiveness of the remediation options

Uncertainty on short and long-term health consequences

Uncertainties related to socio-economic and financial aspects

Uncertainty regarding the quality of future life in the territory

Uncertainty related to social distrust

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MANIFESTATION OF UNCERTAINTY IN POST-ACCIDENTAL CONTEXT - EXAMPLES

Zoning of affected areas

- Post-accident radiological characterization in terms of contamination of areas and projected exposures define the zoning of the affected areas ; useful to :
  - **Prioritize radiological protection and recovery actions**
  - **Define role of the various stakeholders** *(state departments, municipalities, population, etc.)*

\+ A tool which helps decision-makers : design allocation of resources, health surveillance, information and communication efforts, etc. → **uncertainties**, :

- **discrimination and stigmatization effects of affected communities (**Create black and white stereotypes)
- Engenders a sense of unfairness and **generates serious doubts about recommendations**
  "you can/ should not stay or return", "you can/should not drink water and eat food"
- May **leads to inappropriate countermeasure** : evacuation order on too large *(over estimation of the dose)* or too small areas *(under estimation of the dose)*

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MANIFESTATION OF UNCERTAINTY IN POST-ACCIDENTAL CONTEXT - EXAMPLE

Feasibility and effectiveness of the remediation options

→Uncertainty for the management of waste : identification of appropriate streams, availability of storage or disposal endpoints and the definition of threshold values guiding these alternatives several source of uncertainties :

- whatever the remediation strategy chosen ; **the radioactive waste management activities exceed the states capabilities** (japan 2O millions m3 → 10 000 olympics pools of 2500 m 3 →20 to 40 billions euros for the Fukushima prefecture).
  - **Evolution of the waste management laws and rules** with Use of conventional installations to treat contaminated LL contaminated wastes and potential reuse or recycle of contaminated waste (Japan) ?
  - **No adapted disposals adapted to their dangerousness of HL contaminated waste ,** implementation of temporary disposals which stay in place longer than expected *(lack of funds, strong local opposition, etc.)*

→Efficiency depends on the acceptance of the population of the proposed strategies

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CONCLUSION

How to implement these first results ?

Radiological characterization and impact assessment

Zoning of affected areas

Feasibility and effectiveness of the remediation options

Socio-economic and financial aspects

Health consequences

Quality of future life in the territory

Social distrust

- Transversal issues identify : uncertainties may be of different importance depending on the considered stakeholder(s), the evolution over time (at after the beginning of the situation), and the modalities of governance.
- These first results need to be implement within stakeholders panels

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CONCERT

TERRITORIES

…Let's do the job….

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