

IRPA 10

TOPICAL SESSIONS Reports of Co-Chairmen for Highlight Sessions

T-6: Radiological Protection Management in Contaminated Sites and Environments

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Chair and Keynote: J. Lochard

Co-Chair: E. Gallego

Existing contaminated territories are a legacy of past practices, accidents, weapons tests, and mining activities. As the **keynote speaker** and chairman of the session, **Dr. Lochard** (France) pointed out, this is an important question causing concern worldwide due to the high social impact of these situations and the large resources invested to restore the environmental conditions.

The management of contaminated sites and territories relies on a number of key issues of different nature:

- First, there are important **technical questions** to solve, like the characterization of the radiological situation by adequate measurement techniques, the evaluation of the radiological exposures of the affected population and the possible health impacts, and the development of rehabilitation techniques. Much progress has been made in the last decade in all these aspects, which were not directly treated during the session.
- Second, the definition of adequate radiation protection principles and criteria to guide actions and behaviors of both the authorities and the affected communities. In this difficult issue there is an obvious trend to use principles and criteria for practices whenever is feasible. It was pointed out that criteria are usually interpreted as boundaries between safe and unsafe, which seems to be a blocking factor for restoring sites and rehabilitating contaminated territories.
- In a third place, there is a need for models and software tools that help in evaluating and testing alternative intervention and rehabilitation strategies. Great progress has been made over the last recent years in the development of tools for simulating the different radiological, environmental, economic and social impacts resulting and for decision-aiding techniques that assist in the optimization process.
- Finally, it was also clearly stated that, apart from the first point (which can be exclusively confined to the technical sphere) the other aspects, like decision-making to develop criteria and to select restoration and rehabilitation strategies for the long term management of the situation, needs a decided involvement of stakeholders.

In fact, the recent experience in Western Europe, the United-States and the CIS countries shows that the management of contaminated sites and territories cannot

be solved on the bases of radiological protection considerations only. In other words, the current principles and decision-aiding tools need to be integrated in a broader perspective where the involvement of all affected parties seems to be a key of success.

Two of the papers presented constitute a good representation of the state-of-the-art with regard to decision-aiding software tools:

- The PRANA system -presented by Dr. Yatsalo from Russia- is a Geographic Information System for countermeasure analysis in agriculture, in regions affected by Chernobyl accident that allows considering the non-uniform distribution of contamination on soils, and consequently advice on the optimal irregular spatial distribution of the countermeasures.
- MOIRA, - a European development presented by Prof. Gallego from Spain -, that is a software system to select optimal intervention strategies for contaminated freshwater ecosystems. It is based on validated environmental models, and incorporates some new ideas, like a fully developed multi-attribute utility analysis (MAA) module oriented to minimize the environmental, social and economic impact caused by the intervention, and a explicit consideration of the environmental impact through the definition of the so-called "ecosystem index", and the assessment of radiation dose to biota.

During the session, methodologies and case studies were also presented:

- Dr. Sohier from Belgium described the European project RESTRAT in which a methodology for evaluation of intervention strategies, also based on multi-attribute utility analysis, has been developed and tested to different case studies.
- Dr. Oudiz from France presented the methodological guide developed to provide an operational framework for the management of contaminated sites as a result of past practices in his country. The proposed guide ensures the "traceability" of the whole process from assessment to decision. It provides a system of reference for all the stakeholders involved and permits dialogue on a common basis to assure success on the implementation of the selected options.
- The keynote presented by the Chairman also discussed the lessons from the ETHOS project in the Chernobyl area and the SUPERFUND program in the US. In both, the involvement of stakeholders has been demonstrated to be crucial.

As a conclusion, with regard to the management of contaminated sites and territories, radiological protection is just an input into a complex decision-making process. The availability of models and systems as those presented may effectively help into that process. However, involvement of the affected communities is a key to success in designing and implementing effective and sustainable decisions.