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PANEL SESSION 74: Waste Management from Remediation of Legacy Sites or Unplanned Releases

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Panelists:

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2. **Leo van Velzen**, *Environmental and Nuclear Consultant, EURSSEM (Netherlands)*
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4. **Stuart Walker**, *US Environmental Protection Agency*
5. **Ikhom Mirsaidov**, *Nuclear and Radiation Safety Agency (Tajikistan)*

Planning of remediation of legacy sites and contaminated areas arising in unplanned situations needs to take account of the management and regulation of radioactive wastes arising. However, these wastes commonly present unusual characteristics which were not accounted for in design and development of national radioactive waste management strategies nor the corresponding regulatory frameworks. All these activities need to be coordinated, accounting for exposure conditions at a site and in its continuing management. This panel was designed to consider these issues, taking into account developments in guidance on the application of international recommendations to different exposure situations and practical experience at example sites.

Summary of Presentations

Horst Monken-Fernandes: Mr. Monken-Fernandes described the characteristics of legacy sites in the same terms as those used in the IAEA presentation on the International Forum for Regulatory Supervision of Legacy Sites (RSLs), see WM2014 proceedings. Regarding legacies generally, he noted a focus on control of contamination, rather than the real interest, radiation dose. Remediation should not be taken to imply complete removal of measurable radioactivity. Rather, a suitable alternative could be the concept that contamination implies a level of radioactivity that is significant enough to be of concern. To understand what can be of concern requires stakeholder communication. As part of this, it can be useful to consider the balance between the different benefits and dis-benefits to be achieved within a range of spending, and identify the level of spending that provides the greatest difference between total benefits and total costs. For example, it can be understood that adoption of very tight standards can result in generation of a correspondingly large volume of waste requiring management as radioactive waste. The question then requires consideration of where best to use resources to meet social needs, once again a matter for stakeholder communication. There is no single model effective in all circumstances, and none would work for everyone.

To progress in this area it can be noted that we still have lessons to learn from the Goiana accident in Brazil. There is a need to pre-plan the policy in the event of an accident, i.e. to be

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prepared with a transparent process even if the details of implementation will be different for every accident, remembering that short term decisions can have a big impact in the long-term.

Leo van Velzen: How to Improve Scientific Support and Assessments to support Regulatory Supervision

Mr. van Velzen highlighted the IAEA RSLs focus on avoiding the creation of new legacy sites through strong, independent regulatory oversight, and the IAEA ENVIRONET program which encompasses, in addition to dealing with existing contaminated sites (legacy sites), sound environmental management practices to be implemented by active operations and planned operations. This is aimed at preventing the occurrence of relevant environmental contamination and other safety hazards, and consequently the need to implement extensive and costly environmental remediation programs. (NB link to comments of Mr. Monken-Fernandes.) Mr. van Velzen provided examples of best practices in scientific support and assessment, noting IAEA documentation, MARSSIM and EURSSEM, and the need for support:

- to ensure that wastes arising are correctly radiologically characterized and disposed;
- to ensure control of radiological and other hazardous contamination levels at a site;
- in the case of unexpected challenges, ensure regulatory measures can be taken in due time.

Examples of legacies from NORM industry, mentioning historic failure to have in place decommissioning policy and funding arrangements. There are many standards and guidance, but they are not consistent and often do not take into account lessons learned. This needs to be improved.

Yoshiharu Hashizume: Fukushima Remediation, a Contractor's View Mr. Hashizume described some of the logistical challenges that were linked to recovery after the emergency phase of the Fukushima Daiichi accident; including the need to transport and store up to 22 million m³ of contaminated material. Demanding constraints in procurement included recovery on construction investment, impact on engineer/worker/equipment supply. Additionally, there was not experience in many of the required activities, including clean-up of houses, forests, roads and fields. Mr. Hashizume presented data on surface contamination density before and after cleanup, and corresponding reductions in air dose-rate. He also presented a variety of mechanisms that have been put in place to support successful completion of the work, including the application of modified and new technologies. The role of contractors and the need for adequate training and supervision was highlighted. Pilot projects for transportation and interim storage were also outlined.

Stuart Walker: Superfund Policy Statements and Guidance on Disposition of Radioactive Waste in non-NRC Licensed Disposal Facilities

Mr. Walker provided an overview of current EPA guidance, policy statements, and resources on radioactive waste management at Superfund sites and described evaluations under existing guidance and policy statements. Mr. Walker noted the importance of facility design and operation in order to safeguard the public and the environment, and the role of community involvement. He then illustrated the process by reference to two sites: McClellan Air Force Base, CA (Region 9) and Safety Light, P (Region 3). Protection is afforded by risk based standards. In a clarification question, it was noted that the Westlife Landfill in Missouri is a superfund site.

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Ilkhom Mirsaidov: International Support to Regulatory Challenges Related to Legacy Sites in Tajikistan

Mr. Mirsaidov first explained the infrastructure for regulatory control in Tajikistan. He then described the evolution of the uranium mining legacy in Tajikistan, noting for example the very close proximity of some tailings piles to residential areas, and the lack of access control. An urgent remedial measure at Taboshar should be the treatment of the overflowing mine water discharging directly into accessible water bodies. Because of the lack of other water sources, the local population uses this water, which is highly contaminated. Mr. Mirsaidov noted the lack of a relevant modern regulatory basis to provide a driver for implementing improvements, as well as the recent progress made via bi-lateral regulatory cooperation with the NRPA. Deficiencies had been identified by a Regulatory Threat Assessment, and a range of actions put in place to address them, including measures to improve the trust of the public. Implementation projects of the EU, EURASEC and the IAEA were also described.

Strengthening regulatory body, well targeted project, resulting in new and amended laws. Including a new law on radioactive waste management, Rules on radiation safety, monitoring, remediation strategy, then reviewed by IAEA mission has reviewed these outputs and working with schools for drafting regulations (legal documents).

Questions, answers and discussion

A question was raised as to why some authorities regulate on risk and others on dose. Panel representatives said that you can use both.

There was general support for the suggestion to improve the use of the term contamination. It was also noted from the audience that uncertainties in risk estimates at low doses and low dose rates are significant and that this should be considered when seeking to achieve a given level of protection when analyzing remediation alternatives.

The panel noted the value of confidence in the relationship between operators and regulators. Standards are important but a common sense attitude is needed to their application and it is not just about results of numerical models. It is necessary to work within the processes for managing land use and to take care over knowledge management.

It was noted that if the rules change then a remediated site may revert to being a legacy. At the same time, society has a natural desire to improve standards.

The need for further guidance on how to select from a range of reference levels was noted.

Mr. Monken-Fernandes noted that it could be helpful if the time-frame of international support projects was longer than the typical 2-year project time, so as to contribute to long-term capacity building.

Mrs. Sneve noted that we are still learning from the experience of past events such as Chernobyl.

Mr. van Velzen noted that, concerning value for money in remediation, intelligent design of sampling can save significant resources which can then be spent on remediation activities.

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Mr. Ilkhom noted that the regulatory body should not just copy and paste IAEA or other standards without understanding the national level context and local needs.

The value in sharing information was generally noted and increased international cooperation was encouraged.