WM2012 Conference Panel Report

PANEL SESSION 64A: Predisposal Aspects of Waste Management – International Atomic Energy Agency

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Panelists:

1. Susanta Kumar Samanta, *Waste Technology Section, IAEA, (Austria)*
2. Christine Langton, *Savannah River National Laboratory, (USA)*
3. Anthony Wickham, *Nuclear Technology Consultancy, (UK)*
4. Vladimir Kascheev, *JSC VNIINM, Russian Federation*
5. Svetlana Bratskaya, *Institute of Chemistry FEBRAS, Russian Federation*
6. Kamil Kravarik, *VUJE Inc, (Slovakia)*
7. Olga Batyuknova, *SIA RADON, Russian Federation*

This session focused on the current activities in pre-disposal management of radioactive wastes which are being undertaken in association with the Waste Technology Section within the Nuclear Energy Department of the International Atomic Energy Agency. The structure of this session was essentially a detailed presentation from each panelist on a current project being undertaken in association with the IAEA, preceded by an overview of the work of the Waste Technology Section.

Susanta Samanta presented this overview, indicating that the work of the Waste Technology Section on behalf of IAEA Member States represented four major functions: fostering technology transfer, promoting information exchange, cooperative research and building capacity and competencies in Member States. He discussed the variety of publications which these activities produced, particularly illustrating the important guidance offered towards policies and strategies in radioactive waste management. He provided information about recently completed and on-going Coordinated Research Projects (CRPs). Activities being performed to deliver direct assistance to Member States under the Technical Cooperation Program were illustrated by him using several examples. He spoke about the value of creating technical networks, illustrated with examples, the important peer review role which was played by the section and also referred to the specific responses provided following the Fukushima incident.

Christine Langton presented a review of the work of the Coordinated Research Project (CRP) on 'Cementitious Materials for Radioactive Waste Management'. Having examined the more conventional options for cementation, the project had identified novel cements which offered differing and sometimes more stable environments for the immobilized material in terms of hydraulic conductivity and containment leachability. The work was supported by testing and modeling activities and by code development, and provided protocols for quality assurance and subsequent non-destructive characterization methods such as acoustic emissions.

Anthony Wickham discussed the most recently established CRP relating to 'The Treatment of Irradiated Graphite to Meet Acceptance Criteria for Waste Disposal. World-wide there exists some 250,000 tons of this material, arising mainly from reactor core structures. Plans for its disposal within Member States are varied and the perception of the potential hazards it represents are not always consistent. More significantly, waste authorities and plant operators have tended not to take advantage of the unique chemical, physical and mechanical properties of graphite, preferring to include it simply in the general category of intermediate level waste. The objectives of this CRP, which has participation from ten Member States, often with multiple organizations involved, are to improve techniques for material characterization, look at different options for pre-disposal treatment which might lead to a reduction in waste category, isotope recovery or even recycling options, and also to examine novel ways for removal of graphite from the plant which are better tailored towards to the eventual destiny of the material. The work of this CRP will potentially be of great advantage to those Member States faced with short-term requirements for reactor dismantling, such as Lithuania.

Vladimir Kascheev followed this up with a description of the specific challenges faced by the Russian Federation in dealing with the RBMK moderators but also the legacy of highly-contaminated graphite from early production reactors. In addition to treatment technologies such as molten-salt oxidation to immobilize fission-product contamination, incineration techniques first pioneered by the French are being re-investigated, with appropriate attention paid both to the minimal impact on global doses from ^{14}C and to the local-dose implications adjacent to any incineration plant. A prototype plant has been commissioned at the Siberian Chemical Combine near Yekaterinburg to obtain operational information, initially on unirradiated material. The graphite presentations provoked some significant discussion on the population-dose issue relating to incineration, and also on the issue of the different standards and concerns relating to weak beta emitters within different Member States. As chair of the graphite CRP, Anthony Wickham asked for views on whether the CRP should separately investigate such differences, moving towards the possibility of a more unified approach by regulators.

Susanta Samanta offered a second presentation on 'The Modular Design of Processing and Storage Facilities for Small Volumes of Low and Intermediate Level Radioactive Waste including Disused Sealed Sources.' This work represented a successful rationalization of diverse small-scale requirements in individual Member States. The modular concept is chosen for facility design to provide maximum flexibility that allows easy adjustment to changing needs in terms of capacity and variety of waste streams. A number of processing and storage module options are presented and guidance is provided on selection of the appropriate options for particular applications. With the help of information provided it is expected that the user will be able to develop technical specifications with adequate design descriptions for procurement of processing and storage modules. The results of this work will be published as a design and engineering package in 2012.

Svetlana Bratskaya discussed the problem of waste water in the Chernobyl Unit 4 'shelter' arising from the use of dust suppressor sprays. The water leaks into the adjacent Unit 3 area, but the plant constructed to deal with the problem suffered from an unforeseen chemical problem relating to the dust-suppressor material. This resulted in the blockage of heat exchangers by a rubber-like polymeric material. In the framework of a Technical Cooperation Project and in association with the Waste Technology Section of IAEA, the issue had been addressed with flocculating agents, and this approach appears to have been successful.

Kamil Kravarik addressed the technical cooperation with the IAEA over the non-standard wastes arising from the decommissioning of the A1 NPP at Bohunice in the Slovak Republic. An IAEA specialist mission had recommended specific equipment and installations to assist with the problems, and this successful cooperation had resulting in the appropriate installations and provisions to address the specific requirements.

Olga Batyuknova described the detailed planning and implementation of technical training courses involving lectures and practical demonstrations organized through SIA RADON in association with the IAEA. These had proven to be extremely successful with a large number of successful graduates from the courses. New six week courses with focus on predisposal waste management have been planned in cooperation with SIA RADON and the Lomonosov Moscow State University. Interregional training centers had also been established by the IAEA in Istanbul, Santiago and Manila, located strategically to provide specialist advice and training to small-scale operations in those regions.

Susanta Samanta summarized the Panel Session, commenting that the various presentations had illustrated the whole range of work being undertaken within the IAEA Waste Technology Section, offering a balanced program to satisfy the needs of the Member States. Delegates were invited to contact the Section at any time with suggestions for additional work which would assist plant operators and waste authorities in their work. The session had provoked little discussion from the floor, but it appeared that delegates understood and supported the work and also the role of the IAEA in waste management.

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