The IAEA's Programme on Environmental Modelling for RAdiation Safety (EMRAS II)

EMRAS II
Reference Approaches for Human Dose Assessment
Working Group 2
Reference Approaches to Modelling for Management and Remediation at NORM and Legacy Sites

M I N U T E S

of the First Meeting held at IAEA Headquarters, Vienna
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IAEA Scientific Secretary	Working Group Leader
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Initial Ideas and Discussion

The EMRAS II Working Group 2 "Reference Approaches to Modelling for Management and Remediation at NORM and Legacy Sites"(WG 2) began its discussion taking account of the EMRAS II prospectus provided by the IAEA and a proposal presented by the Norwegian Radiation Protection Authority (NRPA). This proposal combined interests in NORM site management with parallel interests in the safe management of legacy sites in general. "Legacy" here is taken to mean sites which have been operated in the past and need, or are expected to need, some form of remediation so as to properly protect human health and the environment. Some of these sites may still be operational or under some form of control, rather than totally abandoned. It was recognised at once that there is some interaction with the Working Groups on "Reference Methodologies for Controlling Discharges of Routine Releases" (WG 1) and "Reference Models for Waste Disposal" (WG 3).

The NRPA proposal focussed on the idea of using assessment tools to support demonstration of the IAEA Safety Fundamentals, the Basic Safety Standards and related requirements, as relevant to legacy sites. *The proposed goal was to establish a forum for regulators, operators and researchers/modellers where models for environmental impact and risk assessment, including remediation measures, could be tested for regulatory purposes.*

Participants and Situations of Interest

29 people participated in discussions including representatives of regulators, operators and technical support organisations (TSOs) from many different countries and regions of the world. The main interest among those present was in NORM sites and issues.

The main types of NORM sites of interest included those linked to uranium mining and milling; the.phosphate industry and phosphogypsum use and disposal; other mining and ore processing activities, but also coal mining; coal burning; NORM from oil and gas industries, and NORM contaminated land, as opposed to factory or mine premises.

Participants were concerned about how to make decisions on the future management of these sites and related situations. This implied: the need for generic guidance on the appropriate standards to apply and measures to be taken; consideration of how to apply them at the national or local level; and the development of assessment techniques to determine the environmental and human health impacts of proposed management options. It was recognised that good information about sites and wastes is needed to make useful prospective assessments, but it was not clear to all participants what information is necessary, or how to conduct or set up a monitoring programme which goes beyond meeting immediate operational safety needs, or how to use that information to develop relevant assessments.

Some sites are already quite well characterised in terms of the wastes and how they are currently controlled and managed (see, for example, the output from the first phase of the IAEA's EMRAS Programme) whereas other sites are not. In all cases there was an interest in better understanding the assessment process and the development of practical guidance on how assessments should be carried out, for NORM in general and for specific types of situations.

While the main interest was in NORM, several participants registered interest in the same issues – guidance on how to carry out assessments - but for legacy sites in general. A significant common feature is the time-frame – falling between planning for the short term continuing and new operations (routine releases and accident situations) and assessment of radioactive waste disposal in repositories over thousands of years. These other timeframes are being addressed in other EMRAS II Working Groups.

Addressing the Challenges

Model development procedures were discussed in the context of NORM situations based, for example, on the IAEA-BIOMASS-6 assessment methodology developed for waste repositories. This includes clear problem specification, the creation and management of FEP-lists, and the use of interaction matrices to develop conceptual and mathematical models. The mathematical representation of radionuclide transfer and exposure processes is not particular to NORM, but each site has its own characteristics which need to be addressed on the timeframe of interest. It was also noted that there are some complex chemical speciation issues which are specific to some NORM sites. In this respect, necessary information about natural radionuclide behaviour and values of transfer parameters (e.g., chemical behaviour, speciation, water and soil characteristics that can influence the natural radionuclide behaviour, etc.) could be compiled. The relevance and application of the update of the IAEA's TRS-364 to NORM situations might also be considered.

Many of the 29 participants were able to describe their specific site interests in more detail, as well as their modelling and assessment experience. Some were able to offer their data and experience for their situations which could be used in development of generic assessment guidance and in the testing of the adequacy of that guidance in particular situations.

Some EMRAS II participants were not able to participate directly in the WG 2 but offered information about their situations, e.g. from Canada, Germany and South Africa.

Initial Work Plan

The original goal proposed by NRPA was accepted with the additional features: to develop a reference approach for NORM site assessments; and to test that approach in practical situations. Two Tasks will begin work in parallel:

(1) General Model Development Process (GMDP) for NORM Sites; and

(2) Trial Application of the GMDP to Specific Sites (this will involve consideration of the useful collation exercise performed during the first phase of EMRAS).

Astrid Liland, NRPA, was proposed and accepted as Working Group Leader (WGL). Danyl Pérez-Sánchez (CIEMAT, Spain) was proposed and accepted as coordinator for Task 1. Richard O'Brien (ARPANSA, Australia) agreed (following the meeting and during the circulation of these minutes) to lead Task 2. The provision of information on the sites (Task 2) was offered by many participants and some additional contributions are anticipated, e.g. from the central Asian republics. It is anticipated that a first iteration of the two Tasks can be completed in 2009.

The WGL agreed to investigate the development of a similarly structured parallel programme focused on development and testing of guidance for other legacy sites.

Next Meeting

It was proposed to hold an interim meeting in September 2009, at the IAEA or in Norway.

List of Participants

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