

**Information from the 2nd Combined Meetings of the IAEA Programme
on Environmental Modelling for RAdiation Safety (EMRAS):
Current Status and Plans for the Future**

IAEA Headquarters, Vienna, 8–11 November 2004

Background. For the purposes of radioactive discharge control, emergency preparedness and response, environmental dose reconstruction and environmental restoration, it is necessary to have the capability to assess the impact of radionuclide releases to the environment. This is achieved by the use of predictive or, sometimes, retrospective modelling of the environmental behaviour of radionuclides. The IAEA's VAMP (1988–1994) and BIOMASS (1996–2001) Coordinated Research Projects contributed significantly to the improvement of modelling in areas of radioactive waste disposal, control of environmental releases and the effectiveness of remedial actions. However, all of the problems are not solved, uncertainties remain in predictive capability in several areas, notably in relation to: the consequences of releases of radionuclides to particular types of environment, e.g. urban and aquatic environments, restoration of sites with radioactive residues, impact of environmental radioactivity on non-human species.

Based on Member States needs, the Agency decided to continue the series of exercises on radioecological modelling aimed at refining existing information and to improve models applied for the purposes of radiation protection of the public and the environment. The relevant Environmental Modelling for RAdiation Safety (EMRAS) Programme was launched at the First Combined Meeting, held 1–5 September 2003 at the IAEA's Headquarters in Vienna, Austria. Two of the Agency's Divisions are involved in the implementation of this project: the Division of Radiation, Transport and Waste Safety (NSRW) and the Agency's Laboratories, Seibersdorf (NAAL).

The overall objective of the EMRAS Programme, its specific objectives, expected results and organization were endorsed at the First Combined Meeting and presented in the **Overview paper** posted with other documents of that meeting: <http://www-ns.iaea.org/projects/emras/>. All the generic points presented in the **Overview paper** remain unchanged since the First Combined Meeting.

EMRAS Programme implementation in 2003-2004. At the First Combined Meeting held in September 2003 at the IAEA attended by 78 participants from 24 countries, the following Themes and Working Groups were established:

THEME 1. RADIOACTIVE RELEASE ASSESSMENT

1. Revision of IAEA Technical Report series No. 364 "Handbook of parameter values for the prediction of radionuclide transfer in temperate environments" (TRS-364 WG).
2. Modelling of tritium and carbon-14 transfer to biota and man (Tritium WG).
3. The Chernobyl ¹³¹I release: model validation and assessment of the countermeasure effectiveness (Iodine WG).
4. Model validation for radionuclide transport in the system "Watershed-River" and in estuaries (Aquatic WG).

THEME 2. REMEDIATION OF SITES WITH RADIOACTIVE RESIDUES

1. Modelling of naturally occurring radioactive materials (NORM) releases and of the remediation benefits for sites contaminated by extractive industries (U/Th mining and milling, oil and gas industry, phosphate industry, etc) (NORM WG).
2. Remediation assessment for urban areas contaminated with dispersed radionuclides (Urban WG).

These Working Groups have successfully operated in the time period between the 1st and the 2nd EMRAS Combined Meetings in 2003-2004. The TRS-364 WG has reviewed available recent information on radionuclide transfer in temperate, sub-tropic and tropic environments and developed a structure for the future revised handbook. The other WGs have been mostly developing experimental scenarios for model validation and performing model calculations to be compared with the experimental data. Only the NORM WG activity was delayed because of change of both the Working Group Leader and the IAEA scientific secretary. More detailed information on particular WG operations can be found at the EMRAS web-site (see above). **The 2nd Combined Meetings, 8–11 November 2004**

The plenary meetings chaired by Mr Gordon Linsley, UK, focused on monitoring current and future EMRAS activities. Two common conceptual issues were discussed specifically.

One of them was the growing societal demand for the development of an environmental protection system. Although development of its international framework and methodology is still on-going, the IAEA considers development and validation of biota dosimetric models within the frame of the EMRAS project to be quite timely and appropriate. This will allow the Member States to have improved and validated biota dosimetric models already available for national implementation when the environmental protection system is developed. This was the rationale for establishing Theme 3 in the frame of the current EMRAS project as follows:

THEME 3. PROTECTION OF THE ENVIRONMENT

1. Model validation for biota dose assessment (Biota WG or BWG).

More information on Biota Working Group operation can be found on the EMRAS web-site.

The second conceptual issue under discussion is related to the increasing globalisation in the areas of radiation protection and radioactive waste management as evidenced by the international legally binding conventions and other international agreements which have come into existence in these areas. In this context, during the meeting, there was discussion of the desirability of moving towards the use of standard internationally approved regulatory environmental impact assessment methodologies and corresponding models for the control of environmental discharges. At present, models exist in the IAEA's suite of safety standards but have been issued at a comparatively low level, that is as a Safety Report. The proposal under discussion was to lift the level of such models within the safety standards so that they would become recommended methods for Member States to adopt. The IAEA will start on the elaboration of this concept and introduce it to the relevant international safety standards committees for their consideration. There will be further discussion of the subject at the next Combined EMRAS meetings.

The Steering Committee meeting held during the 2nd Combined Meetings considered some current managerial issues, such as plans for production of EMRAS documents, mechanisms for Working Groups to contribute to TRS-364 revision, possible time sharing of Working Groups, funding and future meeting plans.

It was agreed that WG intermediate working materials will be posted on their respective web-sites and not printed as hard copies. As for the final EMRAS documents, at least two documents will be printed, i.e., the “TRS-364 revision” and a report containing executive summaries from the reports of other six Working Groups. The full reports of the other six Working Groups will be issued on a CD and might be also printed as hard copies if found necessary.

It was also generally agreed that the other six Working Groups will closely collaborate with the TRS-364 WG and provide it with their findings, both conceptual and model parameter values, in order to ensure that TRS-364 revision is based on the most updated radioecological information.

Some EMRAS participants are interested in participating in meetings of more than one Working Group. This could be achieved if the Working Groups having common fields of interest arranged their spring meetings “back-to-back”, i.e., in the same place and consecutively, during the same week. During the Combined meetings, some WG meetings could be arranged so as to meet the same aim.

During the Second Combined Meeting, the six Working Groups (except for the Tritium WG, which had its fall meeting in September 2004 in Baden-Baden in connection with the International Tritium Conference) continued their operations. The results of their work during three full WG meeting days can be found at their respective web-sites in the form of minutes, scenarios, calculation results and other working materials. They are also presented at this web-page under Presentations.

The next series of the separate Working Group Meetings will be organized during April – June 2005 in Vienna and in some other locations. The Third Combined Meeting will be held from 21 to 25 November 2005 at IAEA’s Headquarters in Vienna.

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