EMRAS

Environmental Modelling for Radiation Safety Working Group 4 – Model validation for radionuclide transport in the aquatic system "Watershed-River" and in estuaries

(IAEA)

6th meeting

14-15 June 2006, IAEA, Vienna, Austria

MINUTES OF THE MEETING

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The sixth EMRAS WG 4 meeting was held in Vienna (Austria) and was hosted by the IAEA (International Atomic Energy Agency). The objectives and aims of the WG meeting were to discuss the status of the WG activities and to plan further activities.

Scenario 1 – Floodplain (Chernobyl), prepared by Gennady Laptev et al. (IHM)

The exercise was finalised. A draft of the chapter for the EMRAS report is ready and a paper was published in the international literature (Monte, L., Perianez, R., Kivva., S., Laptev, G., Angeli, G., Barros, H, Zheleznyak, M. 2006. Assessment of state-of-the-art models for predicting the

mobilisation of radionuclides following the flooding of heavily contaminated areas: the case of Pripyat River floodplain. Journal of Environmental Radioactivity 88, 267-288).

Scenario 2 – The Techa River prepared by Ivan Kryshev and Alexander Kryshev (TYPHOON, Russia)

Further results were presented by the following participants: IRSN, ENEA and Atomenergoproekt (Russia). Therefore, at present, four models have participated to such a complex exercise as Typhoon submitted and discussed the results of a model during previous meeting.

All the modellers will send their results to Typhoon in excel format in order to allow Ivan Kryshev to prepare comparative graphs of the model results. Moreover, modellers should also prepare brief descriptions of their models. These should be sent to both Luigi Monte and Ivan Kryshev for the editing of the EMRAS final report.

Scenario 3 – Tritium in the River Loire, prepared by Marilyne Luck and Nicole Goutal (EDF)

The exercise concerning the migration of ^{3}H was finalized. Results of the assessment of the conservativity of model from IMMSP are expected. A revised version of the scenario for testing models aimed at predicting the behaviour of ^{60}Co in Loire river will be prepared and distributed.

Dan Galeriu (Horia Hulubei National Institute, Romania) has presented model AQUATRIT aimed at assessing the behaviour of ^{3}H in biota. Future possible collaborations will be examined in order to evaluate the opportunity of implementing the methodological approaches of the model in existing decision support systems.

Scenario 4: Estuary of the Dniepr River contaminated with Sr-90 and Cs-137 from Chernobyl, **prepared by Gennady Laptev (IHM, Ukraine) and by Mark Zheleznyak and Vladimir Maderich (IMMSP, Ukraine)**

The exercise was finalised. A draft of the chapter for the EMRAS report is ready and a paper was published in the international literature (Monte, L., Håkanson, L., Perianez, R., Laptev, G., Zheleznyak, M., Maderich, V., Angeli, G. and Koshebutsky, V. 2006. Experiences from a case study of multi-model application to assess the behaviour of pollutants in the Dnieper-Bug Estuary. Ecological Modelling 195, 247-263).

The University of Sevilla and IMMSP have presented and discussed the results of the applications of models to a hypothetical condition of a strong interaction of a radionuclide with sediment. Further results and discussions/assessments are expected.

Scenario 5: **Self-cleaning capacity of Huelva estuary.by Raul Periáñez (University of Sevilla).** Per The University of Sevilla and the IMMSP have submitted preliminary results relevant to the scenario. It was decided of presenting the results to a meeting in Sevilla. Raul Periáñez (University of Sevilla) will be responsible for the management of the relevant actions. The IMMSP, EDF, ENEA, IRSN, NRG and UHI expressed their interest to participate.

Scenario 6: Radionuclide trasfer to biota in a complex estuarine system by **Gennady Laptev, UHI** has presented plans for the preparation of the scenario description. He will prepare a list of parameters, biota species, water characteristics etc., that will be distributed to the participants in order to select the most important data necessary in view of the input required by the models and

the output that models can supply. As an example, the model AQUATOX (developed by the EPA, USA) was presented.

Contribution from the WG-4 to the revision of Tec. Series No 364: The draft of the chapter "Physical processes in freshwater ecosystems" was discussed and approved by the WG.

June, 16th , the document was presented and discussed during the TRS 364 meeting. The main comments are reported in the minutes of the WG-1 (TRS-364):

"*It would be interesting to have tables of parameter values expressed with a range and a best estimate if available, but also some information about co-factors that influence these values. Radionuclide-not dependent and dependent processes might be better highlighted.*

It would be also valuable if parameters and eventually models could be differentiated for rivers and lakes. Marine and estuary environments are not in the scope of TRS."

Moreover, it was also asked to include the full equations for predicting the behaviour of radionuclides in freshwater systems. The difference between values obtained in laboratory experiments and at systemic level should be emphasised.

The Institute of Hydrometeorology (Ukraine), IRSN (France) and VÚJE Trnava, Inc (Slovakia) will gather further data to be included in the chapter (rates of migration water-sediment-particulate matter). Contribution from the Centre for Environmental Chemistry of SPA "Typhoon" (Alexei Konoplev) will be asked.

The next draft version of the document will be ready before the end of September, 2006.

Structure and dead-lines of the final report. According to the suggestions from IAEA scientific secretary, the structure of the final report should be:

a) All the work should be included in a single report;

b) The report should contain:

   1) A first part including (for each scenario):

      i. General description;

      ii. General results;

      iii. Conclusions;

      iv. Recommendations;

   2) A second part including

      i. The detailed description of each scenario;

      ii. The description of each model;

      iii. The detailed results of each scenario.

The data sets of each scenario will not be included in the report. They will be added in the web-site.

The final draft for the discussion by the group members should be ready before the Spring meeting in 2007. The final document should be ready for presentation, discussion and approval during the plenary meeting in Autumn 2007.

The members of the WG-4 are encouraged to plan and manage the dissemination of the WG results in the scientific literature.

The following actions were planned:

Action	by	To be sent to	Dead-line	Note
Final report on ^{3}H in Lore river	EDF	ENEA	End of July 2006	IMMSP should send to EDF the results relevant to the model "conservativity" assessment. The report should be edited according to the proposed structure (see "structure and dead-lines of the final report")
Short description of models (Techa exercise)	Each member that took part in the exercise	Typhoon	End of July 2006	
Results of "Techa exercise"	Each member that took part in the exercise	Typhoon and ENEA	End of June 2006	
Preparation of comparative graphs and assessment of results	Typhoon	Each member of WG-4	End of July 2006	
Preparation of a first draft of a report on Techa exercise	Typhoon	ENEA	End of August 2005	The document will be integrated in the WG-4 final report
Preparation of a draft of the final report	ENEA	Each member of WG-4	End of September	The document should be carefully assessed by each WG-4 member
Performing the exercise "Self-cleaning capacity of Huelva estuary"	All interested participants	University of Sevilla	Before the next plenary meeting	
Plans and actions relevant to the scenario 6	UHI	Each member of WG-4	On time to discuss the matter during next meeting	
Draft description of the scenario "^{60}Co in Loire river"	EDF	Each member of WG-4	On time to discuss the matter during next meeting	
Preparation of an	ENEA	Each member	End of	

up-to-dated version of chapter for TRS		of WG-4	August 2006	

Next WG meeting : 6- 10 November 2006 in Vienna