

**IAEA/EMRAS – Revision of TRS 364, in collaboration with the IUR  
Working group interim meeting, 6<sup>th</sup>-9<sup>th</sup> June 2005, Aix-en-Provence, France**

Philippe Calmon, 8<sup>th</sup> July 2005

List of participants:

Sergey Fesenko, IAEA, scientific secretary  
Philippe Calmon, IRSN, France, chairman in place of Pascal Santucci  
Miquel Vidal, UB, Spain  
Anna Rigol, UB, Spain  
Tamara Yankovich, AECL, Canada  
Philippe Ciffroy, EdF, France  
Jean-Marie Garnier, CEREGE, France  
Gaël Durrieu, CEREGE, France  
Elisabeth Leclerc-Cessac, ANDRA, France  
Laurent Garcia-Sanchez, IRSN, France  
Franck Jourdain, CEA, France  
Frits Van Dorp, NAGRA, Switzerland

**Purpose of the meeting**

The meeting was devoted to discussing on the different contributions provided by people involved in the revision of the TRS 364. Most of the papers were available before the meeting, a few contributions were presented during the meeting. Main conclusions will be given hereafter as well as a work plan until the next meeting in Vienna.

**General recommendations**

In order to help authors to contribute to the revision of the TRS 364, it is recommended to rewrite chapters keeping in mind the two following rules :

- first, describe as clearly as possible the main features of the processes that occur in the concerned environment,
- then, give table of data that can be used to perform calculations.

Moreover, the TRS is not the place for the description of models, but comprehensive processes with the associated parameters are required. At the current stage the majority of the contributions are too long and don't provide brief and concise description and parameterisation of radionuclides transfer in the environment as required for a revised TRS. However, it is clear that such supportive materials are extremely valuable and, as discussed at the November Vienna EMRAS meeting, should be published as a Working Group report potentially as a TECDOC. In this case each such extended contribution should include a summary that could be elaborated for the final TRS revision.

**Paper review**

1 New TRS structure, by P. Santucci:

The plan written, following the last Vienna meeting, has not been modified.

2 Elements concerning some generic sections in the new TRS, by P. Santucci :

Some points have been discussed.

People would have preferred to write the intentions of the handbook as follows: "The handbook is intended for assistance to the assessments of radiological impact of routine and accidental, actual or potential, releases of radionuclides to terrestrial and freshwater environments. Generic data are most often provided, but if site-specific data are available, these are preferable." It would be preferable also

to put this paragraph at the end of chapter 1.1 Purpose. It is possible to precise this main intention in a several objectives like:

- “- updating existing values,
- providing opportunity to take new (processes ?) pathways into account,
- give relevant parameters to derive values and use analogues for extrapolation,
- inform about limitations in using parameters.”

However, these (secondary) objectives have to be presented in the text related to the scope of future TRS application.

Concerning the chapter “2.2 Definitions and units”, the best would be to refer effectively to SRS 19 and ICRU 65 and give maybe some format, but not to put there the complete list of parameters. This would be better if cut and listed in each relevant chapter. A complete list, if necessary could be provided but at the end of the document as an annex.

A question was raised about the exclusion of some ICRU notions as retardation factor and sorbed fraction that would be used in the Kd chapter.

### 3 Principles for using analogues, by E. Leclerc-Cessac :

The use of analogues seems to be very useful in order to fill some gaps with data. The paper is of high quality and, if a little more detailed, it could be published in the Working Group report in form of a TECDOC. For the TRS, it must be condensed. Parameter values given via the use of analogues would be provided directly in the tables of data in each chapter, but identified (italic letters ?) in order to recognize them very easily.

A new version will be delivered for the next Vienna meeting.

### 4 Interception of radionuclides by vegetation, by G. Pröhl :

This contribution was discussed during the last Vienna meeting and will be completed by the author for November. Consequently, the group decided to wait for a new version to discuss it.

### 5 Foliar contamination by deposition, by Y.-H. Choi :

This very short paper gives some data from Asia and will be sent to Gerhard Pröhl in order to integrate it to the appropriate chapter.

### 6 Weathering rate, by E. Leclerc-Cessac :

A literature review of weathering rates for different radionuclides has been presented. A completed version will be delivered by the next Vienna meeting.

### 7 Loss from leaves by weathering, by Y.-H. Choi :

This short paper gives values for Asia. They will be integrated by E. Leclerc-Cessac in her next version.

### 8 Translocation after foliar transfer, by E. Leclerc-Cessac :

The main idea to improve the approach used in this chapter is to group plants in two categories such as plants concerned with translocation and external contamination (leafy vegetables, fruits, ...) and plants concerned with translocation only (potatoes, tubers root and fruit vegetables, ...) is interesting. The idea to group radionuclides in mobile (as caesium) and not mobile (as strontium) is of practical interest.

A completed version will be delivered by the next Vienna meeting.

### 9 Translocation, by Y.-H. Choi :

This short paper gives values for Asia. The contribution will be incorporated by E. Leclerc-Cessac in her next version.

#### 10 Assessment of available contamination in soil, by M. Vidal and A. Rigol :

The paper is of high quality and, if a little more detailed, it should be published in the full scale in the Working Group report in form (the IAEA TECDOC). For the TRS, it must be condensed a lot. Experimental methods to estimate  $K_d$  values cannot be described in the TRS, but just direct applications for radionuclides (best estimate and range). The influence of environmental conditions (pH, chemical levels of different elements, is of high importance if someone will be willing to reduce uncertainty. If these conditions are unknown, limitations in the use of  $K_d$  have to be presented.

The time-dependence of soil-to-plant transfer will be addressed to the “Plant” chapter.

A modified version will be delivered by the next Vienna meeting.

#### 11 Soil to plant transfer, by N. Sanzharova :

Sergey Fesenko presented some slides illustrating the plan for this chapter. It would be appreciable if a paper could be available by the next Vienna meeting.

#### 12 Key references on vertical migration, by F. Strebl :

Sergey Fesenko presented some slides illustrating the plan for this chapter. Besides a list of the references related to this chapter was distributed before the meeting. It is expected the draft text of the chapter will be available before the next Vienna meeting.

#### 13 Inundated systems, by Y.H. Choi :

The paper is written as a publication in a scientific journal. This is of high quality one but it is not possible to report about experimentations in the TRS. The paper has to be condensed in a more practical way: main features of these ecosystems, Table with the relevant parameter values. These inundated ecosystems are so specific that they will be presented in a special chapter devoted to rice. It seems that it is not possible to generalize this ecosystem to some inundated pastures in Europe, because soils are not characterized by so high levels of reduction and European grasses can not survive in such conditions. E. Leclerc-Cessac will present at the Vienna meeting the method that can be used to assess the opportunity of the transfer of the information for inundated environments to temperate conditions.

#### 14 Secondary pathway of contamination due to atmospheric resuspension, by F. Jourdain :

A detailed plan has been presented with different possibilities to assess this process. The aims of the presentation were to select a simple and consensual way for this process description and to provide Table of parameter values for different radionuclides.

Even if parameters cannot be given, it must be said that rain splash generates a secondary contamination at short distance especially for permanent meadows and that wind resuspension works at long distance.

#### 15 Transfer to animals, by B. Howard and N. Beresford :

Based on the meeting in Vienna (30-31<sup>st</sup> May 2005) Sergey Fesenko presented some information on this chapter further development. The next meeting about transfers to animals will be organized in Vienna in December, 7<sup>th</sup> to 9<sup>th</sup>. It would be appreciable if a paper describing the main features of these transfers could be available by the next Vienna meeting. Tables of parameter values could be delivered next year.

#### 16 Forest ecosystems, by Ph. Calmon :

The contribution has to be condensed in order to present the general features of the transfers in this ecosystem and parameter values. The TRS is not the place for the presentation of models. The difficulty to assess the acute phase with simple parameters has to be raised as limitations. The question of wood contamination is not presented in this paper. Thus it is necessary to give information on this transfer. Sergey Fesenko will provide literature about wood transfer and approach to Dr Sheglov with the request to prepare the contribution on this subject. It would be interesting to give some

information about the importance of forest products in the human diet. There is an interest also to have some parameter values for the transfer to fruit-trees, but in the agricultural chapter. F. Carini could be invited to provide this contribution. A modified paper should be presented by the next Vienna meeting and the next six months will be devoted to data analysis in order to provide table of parameter values (aggregated transfer factors, ecological half-life, are the most important). G. Zibold and A. Rantavaara could be helpful for this activity. It has been mentioned that countermeasures are out of the scope of the TRS.

#### 17 Radionuclide transfer by wash-off, by L. Garcia-Sanchez :

This is a new section. This paper presents several means to estimate these transfers. The problem now is to select a simple and consensual way for this process and to provide table of parameter values for different radionuclides. It is proposed to ask Luigi Monte and Jim Smith for advices.

#### 18 Aquatic systems, by Ph. Ciffroy , G. Durrieu and T. Yankovich (biota) :

Ph. Ciffroy provided a plan for this chapter with three main items. First one is the radionuclide exchanges at the interface water-particles (problematic of Kd), second one is the deposition/resuspension processes (problematic of sediments), and last one is the radionuclide transfers to biota.

The problematic of Kd has been presented by Gaël Durrieu. A database about Kd values is under construction with the objective to reduce the variability of Kd values if a minimum of conditions are known. A database for the 8 most known radionuclides will be available for the next Vienna meeting.

The data about transfer to freshwater biota are under compilation (T. Yankovitch) and a database of bioaccumulation factors for fishes and for different radionuclides will be developed to provide statistical analysis of this information. This work is going on.

#### 19 Aquatic systems, by L. Monte :

It has been found that there is some misunderstanding among member of the Working Group involved in the chapter preparation. It is recommended to present the general features, some tables of parameter values and eventually limitations. Moreover, Ph. Ciffroy, G. Durrieu and T. Yankovitch works also on this subject. Consequently, it would be important to share the work and to avoid duplication. In order to inform L. Monte that other people works on certain parts of this subject, all the materials provided by Ph. Ciffroy; G. Durrieu, Yankovitch and L. Garcia-Sanchez (for wash-off transfers) will be sent to L. Monte. It would be very useful to better precise the need of the group that could be asked to L. Monte. It concerns the physical processes that take place in freshwater ecosystems that is to say: diffusion processes, deposition and resuspension of sediments.

#### 20 Radionuclides in tropical and sub-tropical ecosystems, by S. Uchida :

The contribution is rather useful however it is written in the manner of an original article presented to a scientific journal. For the application of this contribution it should be rearranged to the form of summary. Thus, the contribution has to be condensed in a more practical way: main features of these ecosystems, table of parameter values. It seems that Tables of values have not been received with the text. This contribution should be added to the chapter on rice.

#### 21 Chlorine-36, by E. Leclerc-Cessac:

The paper gives rather useful approach for the assessment of chlorine-36 behaviour in the environment. However, it has to be condensed, especially the first page and must retain only the arguments that justify the specific activity model. Tables of values must be modified in order to provide a proposed value and a range. When the paper would be rewritten according to these considerations, it would be a good opportunity to send it to the “tritium and  $^{14}\text{C}$  working group” in order to ask them to write something equivalent for tritium and carbone-14.