



الوكالة الدولية للطاقة الذرية
 国际原子能机构
 International Atomic Energy Agency
 Agence internationale de l'énergie atomique
 Международное агентство по атомной энергии
 Organismo Internacional de Energía Atómica

7th EMRAS TRS-364 Working Group Meeting
 (Revision of IAEA Technical Report Series No. 364, “Handbook of parameter values for the prediction of radionuclide transfer in temperate environments”)

6–10 November 2006
IAEA Headquarters, Vienna

MINUTES

List of Participants:

Mr. Calmon, P.	IRSN	France	Chairman
Mr. Choi, Y. H.	KAERI	Korea	
Mr. Fesenko, S.	NAAL, Seibersdorf	Austria	IAEA Scientific Secretary
Mr. Isamov, N.	RIARAE	Russia	
Mr. Kashparov, V.	UIAR	Ukraine	
Ms. Leclerc-Cessac, E.	ANDRA	France	
Mr. Proehl, G.	GSF	Germany	
Ms. Rantavaara, A.	STUK	Finland	
Ms. Sanzharova, N.	RIARAE	Russia	
Ms. Shubina, O.	RIARAE	Russia	
Ms. Strebl, F.	ARC Seibersdorf	Austria	
Ms. Tagami, K.	NIRS	Japan	
Mr. Tarjan, S.	National Food Investigation Inst.	Hungary	
Mr. Thiry, Y.	SCK-CEN	Belgium	
Mr. Uchida, S.	NIRS	Japan	
Mr. Van Dorp, F.	NAGRA	Switzerland	
Ms. Van Graan, H.	PBMR	South Africa	
Ms. Varga, B.	National Food Investigation Inst.	Hungary	
Mr. Vidal, M.	Universitat de Barcelona	Spain	
Ms. Voigt, G.	NAAL Seibersdorf	Austria	IAEA Scientific Secretary
Ms. Yankovich, T.	AECL	Canada	
Mr. Zibold, G.	Hochschule Ravensb.- Weingarten	Germany	
Mr. Beresford, N.	CEH	U.K.	“Dose to biota” WG
Mr. Davis, P.	AECL	Canada	“ ³ H & ¹⁴ C” WG
Ms. Howard, B.	CEH	U.K.	“Dose to biota” WG
Mr. Monte, L.	ENEA	Italy	“Freshwater” WG

Foreword

I wish to thank all the participants for their contributions and their work during the last six months and this week. Many thanks also to the other working groups which very effectively contributed to our working group. I also wish to thank NAAL-Seibersdorf and Mr. M. Thorne for editing the contributions. We have now a four hundred page report of very high quality, very close to the requirements of a TECDOC.

MINUTES

1. Week Reporting

Work in small groups (Tuesday)

The report containing all the contributions was edited just before the combined meeting in Vienna. The different contributions so far received have been reviewed and edited by Mike Thorne and Serguei Fesenko. The report was made available at the first day of the meeting. Decision has been taken to first work in small groups in order to examine the different modifications and comments made throughout the texts, to correct when possible and to eventually report in case of some different opinions or difficulties..

Whole group meetings (Wednesday and Thursday)

Each chapters and subsections have been discussed to examine if comments could be easily answered and to discuss about some difficult points. Opportunity was given to present the required IAEA format (Mr. S. Fesenko will send extractions from the IAEA style manual for publications and documents in English to the WG members) and to achieve harmonization on presenting data and references in tables.

References have to be provided with numbers as explained by the IAEA style manual. Concerning the chapters for which a database is not prepared, if references are not numerous, they can be set as numbers in tables. If more than approximately ten, only the total amount of references would be proposed in the table. It seems to be useful to have somewhere, maybe at the end of the chapter or subsection the entire list of references, in order to allow modellers to easily locate the original paper. Latin names have to be written in italic letters with a capital letter for the first name (ex : *Boletus edulis*).

In the introduction chapter on terms and units used, reference will be made to the ICRU 65 report. The objective is to use those as much as possible but, taking into account the consistency with the former TRS and the SRS-19 it is recommended to use the notifications and units used in the above IAEA documents. In such cases, authors are requested to define the parameters and the units they used in each chapter or subsection.

It is important to mention at the end of the different chapters where a lack of data has been identified that experimental studies are needed in order to fill these gaps.

In the introductory chapter, it should be a place to repeat (as it was in the TRS-364) that site-specific data are always preferable than generic ones even if literature reviews could give average and range of data.

2. Discussion throughout the different Chapters

Forest chapter (Mr. P. Calmon, Mr. Y. Thiry, Ms. A. Rantavaara, Mr. G. Zibold)

- To write in the introduction some words about the radionuclides for which data are available or not.
- Mushrooms and berries. To put the two names for *Vaccinium vitis-idaea* : cowberry and cloudberry. To provide only one column for geometric mean even if only one or two values are available. To put references in the last column. When preparing the TRS draft, it seems that mushroom species could be grouped in a few categories related to the range of their transfer factor value. Comparing with the former TRS, the data for honey will be kept, mentioning that this value originates from the TRS-364.

- Game animals. Several comments are in the text. The table on roe deer shot would be kept for the TECDOC, but not for the TRS.
- For trees. The lack of data for other radionuclides than caesium has to be commented. Mr. Fesenko would provide data on strontium from the Kysthym accident (deadline February 2007). Ms. A. Rantavaara would provide a paragraph on the contamination of understorey and values for tree/wood radionuclide transfer for other elements than caesium (deadline February 2007).

Foliar transfer (Mr. G. Proehl, Ms. E. Leclerc-Cessac, Mr. Y. Choi)

- Interception. A few comments mainly on the format.
- Weathering and translocation. The classification of soils and plants should be moved in chapter 2 before the “Use of analogues”. Several chapters could then refer to it. In the definition, it is important to say that translocation is not considered for leafy vegetables and grass, because of the total contamination by deposition. The presentation of data according to the growth stages of plants is a real improvement. If the same could be done for fruit vegetables, even if data are not available for all the stages. Values for translocation coefficient are not easy to find for all elements. The use is to group elements according to their supposed mobility in the plant. To class elements in only two categories (mobile and immobile) seems too restrictive. The possibility to create intermediate classes would be highly valuable. In the tables of parameter values, please give only geometric mean and min and max values.

Use of analogues (Ms. Leclerc-Cessac)

Some examples are in the text, but some tables are needed to group the information. It is important also to stress the limitations in the use of analogues and to identify the main gaps.

Soil Kd and vertical migration (Ms. F. Strebl, Mr. M. Vidal)

The description of the database could be better placed in an appendix, even if a brief description could be included in the chapter itself. In case of gaps in tables of parameter values, but not in the former TRS, it is asked to put these data in the tables clearly mentioning that this value originates from the TRS-364. It would be certainly useful to add somewhere a comment saying that for Kd the use of the arithmetic mean, even if provided, is without interest and it is much better to use the geometric mean.

Soil-to-plant transfer (Ms. N. Sanzharova, Ms. H. Vandenhove, Mr. H. Velasco, Mr. S. Uchida)

A precision in the parameter values of 2 digits is largely enough taking into account the parameter variability. The scientific format is also required with only one decimal as follows: $2.1 \cdot 10^{-4}$

Concerning tropical and sub-tropical data, it is important to follow the classification of soil types and plants in order to process the data in the same way as for temperate environments.

No data are available for the moment for fruits. Upon request of NAAL Ms. Carini offered her help during the last interim meeting. It is now urgent to get a contribution to this subsection. Scientific secretaries of the WG will provide further contacts with Ms. Carini and other potential contributors including Ms. Varga representing the National Food Investigation Institute (collaborative centre for the Agency Laboratories). Concerning the transfer to rice, the description of soil types is important in order to integrate the data in the soil-to-plant database.

Aerial transfer factor (Mr. Y. Choi)

The paper from Mr. Y. Choi will be integrated in the soil-to-plant transfer chapter in order to deal with acute deposition of radionuclides during the growing period of selected crop species.

Stable elements transfer factors (Ms. K. Tagami, Mr. S. Uchida)

Mr. S. Uchida and Ms. K. Tagami presented a set of soil-to-plant transfer factor data based on stable isotopes. In the soil-to-plant transfer chapter, it was decided to present only data about radioactive elements. However, there is a possibility to integrate this stable isotopes approach in the chapter dedicated to the use of analogues. A comment has to be made stressing that data on stable elements are site-specific and their use as analogues must be done carefully.

Tea leaves (Mr. S. Uchida)

Mr. Uchida suggested to send data on tea leaves to Ms. Sanzharova in order to be integrated in the database.

Food processing (Mr. S. Conney, Mr. V. Kashparov)

Different parameters could give information about food processing, but it is decided to report data in the form of the Food processing Factor and not as it was in the former TRS. This parameter is much more valuable since it gives information about the decontamination efficiency of the product, but also on the process. Mr. Conney added interesting data on delays between harvesting and consumption, taking into account average times for storage and processing of foodstuffs.

Freshwater biota (Ms. T. Yankovich)

This contribution is extremely useful however it is very long. An opportunity to provide more consolidated tables should be considered. There is a possibility to provide concentration ratios or aggregated transfer factors for birds. It was agreed to limit the information on inland waterfowl and freshwater mammals.

Physical processes in freshwater (Mr. L. Monte)

The contribution has been improved during this week to account for examples of sub models to calculate water velocity and with factors influencing Kd values. The data presented in the table 8.6 are site-specific and originate mostly from marine or estuarine measurements. Their applicability to freshwater is therefore questionable. Comments have to mention the limitations in the use of these data and the necessity to determine on-site values. Even if it is not completely required for the TECDOC, it is needed for the TRS to propose alternative simple methods with the corresponding set of parameter values to assess, even roughly, the radionuclide transfers in rivers. Mr. Patrick Boyer from IRSN will make a proposal.

Specific activity modelling : 3H and ^{14}C , ^{36}Cl (Mr. P. Davis, Ms. E. Leclerc-Cessac)

The contribution is of high quality, but some complements are needed. The limitations of the use of specific activity models have to be stressed. An introduction made by Ms. Leclerc-Cessac in a previous version could be easily added at the beginning. If data are available, it would be suitable to take into account the contamination of soil by irrigation and also data on other environments than temperate one.

Concerning ^{36}Cl , for the TRS several plants could be grouped and for the TECDOC the classification proposed in the soil-to-plant transfer chapter could be used.

A discussion raised on the possibility to treat iodine with these specific activity models. Theoretically, it is possible like other regulated macro elements. But speciation of iodine in soils is very often unknown. If different isotopic ratios of iodine, originating from several feeding stuffs, the use of specific activity models is not possible. Consequently, it was decided to treat this element without specific activity models.

Transfer to animals (Ms B. Howard and Mr. N. Beresford)

A database has been created to compile individual references about transfer of radionuclides to animals. Data have been individually checked and originate from the Green & Woodman database, referring mainly on caesium, strontium and iodine; from a literature review of post-1991 papers. The Special Issue on Animal Transfer of JER is in progress and will provide valuable input to the chapter. An example of the information compiled for the special issue was given for the transfer of plutonium to cow milk. Since the last TECDOC meeting much effort has been focused on compiling information from Russian language literature primarily by the Agency Laboratories assisted by RIARE in Obninsk.. The review Russian language literature has identified a lot of data previously not considered in English language documents including TRS364 on ruminants, pigs and hens. Four papers will be submitted dealing with gut absorption, transfer and biological half-lives. A final draft of the TECDOC will be delivered for the June interim meeting.

Useful additions to some subsections

Especially for semi natural environments, it was foreseen to add a chapter on Arctic, Antarctic, Alpine and Upland environments. For the soil-to-plant transfer chapter, the objective was to give some information on fruits. The scientific secretariat of the WG will continue its efforts to find contributors to these chapters. The contribution is awaited for April 2007.

3. Deliverables and Agenda

First deliverable: TECDOC

The contributions are collated, edited and the draft version is very close to finalization. As agreed during the last meeting these will be published as a TECDOC. Contributors are asked to provide a final draft for April 2007, in order to allow the editing of the whole report for the interim meeting. So possible it is highly welcomed to send them as soon as possible (February could be a facultative milestone). Contributors to individual sections of the TECDOC are also encouraged to provide for every chapter recommendations and conclusions, including justification of gaps in current knowledge and needs for further research if necessary.

Second deliverable: publication in a special issue of JER

This opportunity, offered by Ms. Voigt is a way to individually valorise the work of the different contributors. It is intended to publish the different chapters or subsections in about 20 papers each with 6 to 10 pages. The work would consist in extracting the main features of the TECDOC. It is intended to publish the different chapters or subsections and notably these ones originating from other working groups (transfer to ^{14}C and ^3H and physical processes in rivers). The JER format will be sent in the following weeks, but first, we need to know for each paper the title and the authors and an idea of the number of pages (deadline: 15 December 2006).

Deadline for the submission of completed papers: April 2007. Review will start in June 2007. The intention is to have the final papers for November 2007.

Third deliverable: first draft for TRS

Even if this future TRS will be extended compared to the former one (to be used as a handbook), the objective is to write a more concise document than the TECDOC following the structure:

- Definition
- Description of processes
- Parameters
- Limitations
- Tables of parameter values
- Comments and recommendations (identification of gaps)

This work will be done at the initiative of the different authors. The objective is to extract the main information from the TECDOC and to synthesize the tables of value. The first draft is needed for April 2007, in order to allow the editing of the whole TRS for the interim meeting. This first draft will be discussed during the June interim meeting. A final draft is expected for November 2007.

4. Miscellaneous

Next interim meeting

The next interim meeting will be organized by IRSN in Paris (Tour Eiffel) from the 6 to 8 of June 2007 (3 days). This meeting will be mainly devoted to the finalization of the TECDOC and evaluation of the materials presented for the revised TRS. Working Group Leaders from the three other working groups are invited to participate. Information and agenda will be sent in February 2007.

International IAEA Conference on Environmental Radioactivity

The IAEA will organize this conference from 23 to 27 April 2007 in Vienna (see the IAEA web pages on <http://www-pub.iaea.org/MTCD/Meetings/Announcements.asp?ConfID=145>). On the 26th April, the session will give the opportunity to the EMRAS project working group leaders to present the main achievements of the work conducted in the frame of the EMRAS programme. Mr. P. Calmon, Mr. S. Fesenko and Ms G. Voigt will prepare a synthetic paper for this conference.

Availability of our draft TECDOC on the IAEA web pages for comments

Mr. G. Linsley suggested to put the draft TECDOC on the website of the IAEA in order to receive comments from outside our EMRAS group. This is rather usual to send draft reports for opened consultation before finalization. However, sections of the report still require substantial additions and it would be preferable to do that not earlier than March 2007, taking into account the additions and the main comments provided by Mr. M. Thorne and the WG members (deadline is still April for the final draft). The TECDOC would then be put on the IAEA website for consultation until our June meeting, when we could consider the any comments.