IAEA/EMRAS – Revision of TRS 364, in collaboration with the IUR
Working group combined meeting, 8th-11th November 2004, IAEA Headquarters
Pascal Santucci

MINUTES OF THE COMBINED MEETING

The meeting was held at the IAEA headquarters, Vienna, Austria, from the 8th to the 11th November 2004.

The participants were :

Pascal Santucci, IRSN, France, chairman
Sergey Fesenko, IAEA/NAAL, scientific secretary
Paul Martin, IAEA/NAAL
Philippe Calmon, IRSN, France
Aud Raaum, Institute for Energy Technology, Norway
Elisabeth Leclerc-Cessac, ANDRA, France
Ian Barraclough, Enviros, UK (on behalf of ANDRA)
Miquel Vidal, University of Barcelona, Spain
Marguerite Monfort, CEA, France
Stuart Conney, Food Standard Agency, UK
Zhaorong Shang, NSC, China
Yong Ho Choi, KAEI, Korea
Philippe Ciffroy, EdF, France
Tamara Yankovich, AECL, Canada
Charley Yu, Argonne National Laboratory, USA
Laurent Garcia-Sanchez, IRSN, France
Gerhard Proehl, GSF, Germany
Shigeo Uchida, NIRS, Japan
Natalia Sanzharova, RIARAE, Russia
Frits Van Dorp, NAGRA, Switzerland
Eiliv Steinnes, NTNU, Norway
Nick Beresford, CEH, UK

The main target of the meeting was the finalisation of the TRS critical analysis and the discussion about the contributions which should be used to start the new TRS version ; an important task was also the agreement about the actual contents of the new TRS and the associated overall organisation.

1. New contributions to the revision of TRS364

Most contributions (documents, databases, references) received by P. Santucci were distributed to the participants prior to the meeting :

- an actualised version of the critical analysis of the current TRS (P. Santucci) including comments from several participants ;

- proposal of a new TRS structure (G. Voigt, S. Fesenko) ;

- use of analogues for the derivation of values : one draft report (E. Leclerc-Cessac, I. Barraclough) ;

- interception by plant foliage: draft section with tables (G. Proehl) ;

- plant retention and translocation: draft section with tables (E. Leclerc-Cessac) ;

- soil Kds : work plan and initial database (M. Vidal) ; draft section (S. Roussel-Debet) ;

- wash-off : work plan, initial database, draft section (L. Garcia-Sanchez) ;

- forests : work plan and key references (Ph. Calmon) ;

- river systems : a draft report (EMRAS Watershed WG) ; work plan (Ph. Ciffroy).

All these contributions were to be added to the already existing, mentioned in the former meeting minutes : texts on Asian food chains (Y.H. Choi and S. Uchida) ; technical material with 90% of the TRS 364 references which had been recovered (about 200), and about 400 new references of interest which had been issued later than 1992, including reviews and syntheses, and some databases (IUR on soil-to-plant transfers, IAEA CRP on tropical systems, EU RadFlux (multi-compartments), national databases (NRPB, IRSN) on Kds, soil-to-plant TFs, animals and food processing).

The contributions were discussed along the week. Contributors introduced their work to the group, and discussions led to comments and suggestions. **Contributors were expected to produce draft sections and data tables in the first quarter of 2005, well before the next interim meeting.**

N. Beresford presented elements of discussion concerning transfers to animals and animal products.

2. Structure of the new TRS

The following table was adopted as the main structure of the future TRS. Names of active contributors were also indicated (this table is indeed the latest available version, March 2005) :

Section	Title	Technical contents	Comments	Contributor
1.	**INTRODUCTION**			**Santucci**
1.1.	**Purpose**	general purpose, some words about the history and rationale of the revision		
1.2.	**Radioecology for safety assessment**	Some words about concepts in radioecology (former 1.2 in TRS364) within the safety assessment context		
2.	**BASIC CONCEPTS**			
2.1.	**Main components of the biosphere**	diagram or interaction matrix with main compartments and interactions		**Santucci**
2.2.	**Definitions and units**	Definitions (see ICRU 65, SRS 19) and units: only the most generic; other def. put in technical sections	plus extra annex centralising notations, definitions and some expressions	**Santucci**
2.3.	**Issues related to the management of data**	Data analysis: methodology, rules for selection and derivation, expert judgment; difficulty to propose best-estimates and ranges; consequences of uncertainty/variability on the performance of assessments		**Santucci**
2.4.	**The use of analogues for deriving quantities**	Generalities concerning the use of analogues; specific aspects put in technical sections		**Leclerc-Cessac, Barraclough**, Ciffroy

3.	**AGRICULTURAL ECOSYSTEMS**			
3.1.	**Exchanges between atmosphere, plants and soil**	Atmosphere / plant / soil sub-system	should address tropical etc. systems as far as possible	
3.1.1.	***Interception by vegetation, weathering and translocation***		what about parameters such as yield, LAI, water content?->to be put in a preliminary section	
3.1.1.1.	Foliar contamination by dry deposition			**Proehl**
3.1.1.2.	Foliar contamination by wet deposition		should address spray irrigation	**Proehl**
3.1.1.3.	Losses from leaves by weathering			**Leclerc-Cessac**
3.1.1.4.	Translocation of contamination through plant to edible organs			**Leclerc-Cessac**
3.1.2.	***Assessment of available contamination in soil***	Soil processes		
3.1.2.1.	Partition of contamination between solid and liquid phases	Kd concept		**Vidal**
3.1.2.2.	Evolution of bioavailability with time	Dynamics in soils (available fraction for subsequent exchanges: ageing effect)		**Vidal**
3.1.3.	***Vertical migration through top-soil***		location to be checked (outside agricultural?)	**Strebl,** Gerzabeck, Kirchner
3.1.4.	***Plant uptake from soil***			
3.1.4.1.	Root uptake	Reference transfer factors values	IUR data and CRP on tropical systems	**Sanzharova**
3.1.4.2.	Contamination of plants by resuspension and soil adhesion			**Strebl,** Gerzabeck
3.1.4.3.	Inundated systems	Flooded plains; flooded pastures; rice paddy fields		**Choi, Uchida on rice; Leclerc-Cessac, Vidal start on floods**
3.1.5.	***Evolution of plant contamination with time***	Ecological half-lives in plants		**Sanzharova**
3.1.6.	***Secondary contamination by resuspension***	Secondary contamination pathway for atmosphere	location to be checked (outside agricultural?)	**Jourdain**
3.2.	**Transfer to animals and animal products**		plan preliminary section on non-radioecological parameters	**Beresford**
3.2.1.	***Modelling assumptions***			
3.2.2.	***Transfer from feed to milk***			
3.2.2.1.	Reference values for steady state conditions			
3.2.2.2.	Biological half-lives			
3.2.3.	***Transfer from feed to meat and eggs***			
3.2.3.1.	Reference values for steady state conditions			
3.2.3.2.	Biological half-lives			
4.	**RADIONUCLIDES TRANSFER IN SEMI-NATURAL ECOSYSTEMS**			**Calmon**
4.1.	**Introduction**		intro: generalities, includ. use of aggregated parameters	

4.2.	**Radionuclide transfer in forests**		oriented to radiological assessment (man): document processes in text but tables about final outputs only; wood contamination OK but generic. Discuss dynamic modelling (interest and limits)	+Ziebold
4.2.1.	***Compartments and processes in forests***			
4.2.2.	***Modelling assumptions***	steady state / dynamic modelling (include. biological half-lives)		
4.2.3.	***Aggregated transfer coefficients***			
4.2.3.1.	mushrooms			
4.2.3.2.	berries			+Rantavaara?
4.2.3.3.	wood			
4.2.3.4.	game/animals			**+Beresford**
4.3.	**Radionuclide transfer in other semi-natural systems**	sheep on pastures; reindeer in tundra (not in forest). Is it useful to explicitly address plants (not consumed by man?)	depends on data availability: check recent literature	**Beresford through animals**
5.	**RADIONUCLIDES TRANSFER IN FRESHWATER ECOSYSTEMS**			**Ciffroy, River WG**
5.1.	**Flux from soils to river systems**	Catchments processes. Run-off, wash-off		**+Garcia-Sanchez**
5.2.	**Exchanges between water and particles**	Radionuclides transfer in water column	chemistry oriented	
5.2.1.	***Suspended particles***			
5.2.2.	***Bottom sediments***			
5.3.	**Advection/ Dispersion/ Sedimentation**		physics oriented	
5.4.	**Transfers to biota**	aquatics food chain; several fish species at least; freshwater clamp (info from China?)		**+Yankovich**
6.	**FOOD PROCESSING**		simplify TRS tables by focusing on most effective methods	**Kashparov**
6.1.	**Processing of plant products**			
6.2.	**Processing of animal products**			
6.3.	**Processing of mushrooms and berries**			
6.4.	**Processing of fish**			
Annex 1	**List of parameters**	parameters, definitions, units, location in main text		**Santucci starts,** all contributors
Annex 2	**List of tables**	location in main text		all contributors
Annex 3	**Tables of original values**	"real" values, not derived by expert judgment		all contributors
various	Asian food crops			Uchida, Choi
various	tritium, carbone 14			H3&C14 WG?

various	chlorine 36			Leclerc-Cessac starts

The so-called technical contents in this table was to be seen as a reminder of some issues, and not as a detailed description of the future sections. This should be done in the future according to the contributions and the discussions. A list of parameters should also be added in a short period as an extra column.

Concerning the radionuclides of interest, it was decided to take the current TRS Kd table as the reference spectrum.

According to the table, it was noted that the following people accepted the responsibility of sections :

- P. Santucci on the most general aspects (introduction, basic concepts), and the overall organisation and consistency ;
- E. Leclerc-Cessac on the use of analogues for the determination of parameter values, on plant translocation and weathering, on flooding with M. Vidal ;
- G. Proehl on foliar interception ;
- M. Vidal on Kd ;
- F. Strebl on vertical migration through soil and plant contamination by soil ;
- N. Sanzharova on plant uptake and ecological half-lives in plants ;
- Y.H. Choi and S. Uchida on Asian food chains (even if not exactly a section in itself) ;
- L. Garcia-Sanchez on wash-off ;
- F. Jourdain on resuspension from soil ;
- N. Beresford on animal products ;
- Ph. Calmon on forests ;
- Ph. Ciffroy on river systems, with T. Yankovich on the biotic aspects ;
- V. Kashparov on food processing.

People accepted also to contribute on more peculiar aspects and/or to help the people in charge of sections (see again the table).

3. Collaboration and communication

An agreement had been reached so that to transform the IAEA/EMRAS WG activities into a joint activity with the International Union of Radioecology. This should help at creating synergies between the IAEA and IUR structures : links with IUR task groups, experts for review, databases from IUR, centralisation of funding, etc.

It was decided to feed the IAEA/EMRAS web site with the latest version of the TRS critical analysis, the presentations to the Ecorad2004 Congress and to the IUR General Assembly, and the Ecorad2004 paper.

4. Work plan

The expected overall work plan was reminded :

- Before EMRAS plenary 2004 : critical analysis nearly achieved, identification of responsible experts nearly complete, gathering of old and new references advanced, gathering of databases advanced ;

- June 2005, WG meeting, Aix-en-Provence, with all interested participants : start of overall TRS drafting with specified contributions ;

- End 2005, EMRAS plenary : final documents on the TRS critical analysis and on data availability, draft of TRS concerning already included parameters, draft on new parameters/ processes to be included, draft CD-rom with new data ;

- April/May 2006, WG meeting, Aix-en-Provence, with all interested participants ;

- End 2006, EMRAS plenary : draft of overall new TRS, draft 2 of CD-rom with source data

-2007 : finalisation and edition.