The IAEA's Programme on Environmental Modelling for RAdiation Safety (EMRAS II)

EMRAS II
Reference Approaches for Human Dose Assessment
Working Group 1
Reference Methodologies for "Controlling Discharges" of Routine Releases

M I N U T E S

of the Fifth WG1 Meeting held at IAEA Headquarters, Vienna
24–28 January 2011
(during the Third EMRAS II Technical Meeting)

IAEA Scientific Secretary	Working Group Leader
Mr Diego M. Telleria ***(DMT)*** Assessment & Management of Environmental Releases Unit, Waste & Environmental Safety Section, Division of Radiation, Transport & Waste Safety (Room B0763) International Atomic Energy Agency (IAEA) Vienna International Centre PO Box 100 1400 VIENNA AUSTRIA Tel: +43 (1) 2600-22679 Fax: +43 (1) 2600-7 Email: D.Telleria@iaea.org	Mr Trevor J. Stocki ***(TJS)*** Research Scientist Radiation Protection Bureau, 4th Floor, AL 6604C Health Canada 2720 Riverside Drive K1A 0K9 OTTAWA, ONTARIO CANADA Tel: +1 (613) 941-5175 Fax: +1 (613) 960-5604 Email: trevor_stocki@hc-sc.gc.ca

Attending	
Name / Initials* / Email	**Organization / Country**
Mr Ali Attarilar ***(AA)*** (aattari@aeoi.org.ir / attarilar@yahoo.com)	Iranian Nuclear Regulatory Authority (INRA), ISLAMIC REPUBLIC OF IRAN
Ms Anna Maria Blixt Buhr ***(AMBB)*** (annamaria.blixtbuhr@vattenfall.com)	Vattenfall Power Consultant AB, SWEDEN
Mr Iurii Bonchuk **(IB)** (bonchuk@rpi.kiev.ua / bonchuk_yuri@hotmail.com)	Ukrainian Radiation Protection Institute (RPI), UKRAINE
Mr Pavol Chylý ***(PC)*** (chyly.pavol@enel.sk)	Slovak Electricity (SE-VYZ), NPP Mochovce, SLOVAK REPUBLIC
Ms Adriana Raquel Curti ***(AC)*** (acurti@arn.gob.ar)	Autoridad Regulatoria Nuclear (ARN), ARGENTINA
Ms Dejanira da Costa Lauria ***(DCL)*** (dejanira@ird.gov.br / dejanira.lauria@gmail.com)	Instituto de Radioproteção e Dosimetria (IRD/CNEN), BRAZIL
Mr Rudie Heling ***(RH)*** (heling@nrg.eu)	Nuclear Research & Consultancy Group (NRG), NETHERLANDS
Mr Mirshahram Hosseinipanah ***(MH)*** (mirshahram@gmail.com)	Iranian Nuclear Regulatory Authority (INRA), ISLAMIC REPUBLIC OF IRAN
Ms Viktoryia Kliaus ***(VK)*** (vkliaus@gmail.com)	Republican Scientific-Practical Centre of Hygiene (RSPCH), BELARUS

*Initials used to refer to participants within minutes and actions as appropriate.

Attending	
Name / Initials* / Email	**Organization / Country**
Mr Pawel M. Krajewski ***(PK)*** (krajewski@clor.waw.pl / pawmarkra@gmail.com)	Central Laboratory for Radiological Protection (CLOR), POLAND
Mr Gaétan Latouche ***(GL)*** (gaetan.latouche@cnsc-ccsn.gc.ca)	Canadian Nuclear Safety Commission (CNSC), CANADA
Mr Gordon S. Linsley ***(GSL)*** (gordon_linsley@yahoo.com)	Private Consultant, UNITED KINGDOM
Mr Mourad Messaci ***(MM)*** (mmessaci@yahoo.fr)	Commissariat à l'Energie Atomique (CRNA/COMENA), ALGERIA
Mr Christophe Mourlon ***(CM)*** (christophe.mourlon@irsn.fr)	Institut de Radioprotection et de Sûreté Nucléaire (IRSN), FRANCE
Ms Laura Newsome ***(LN)*** (laura.newsome@environment-agency.gov.uk)	The Environment Agency, UNITED KINGDOM

*Initials used to refer to participants within minutes and actions as appropriate.

Introductions

TJS welcomed everyone and gave a brief introduction on EMRAS II Working Group 1 (WG1) and its work for the benefit of new participants.

Discussions

Scenario C: Chalk River (the river model)

TJS began the discussions by presenting the questions/concerns that submitted by Justin Smith[1] ***(JS)*** via email. These concerns were related to some of the parameters of the river. Lauren Bergman ***(LB)***[2] has been investigating whether it would be possible to obtain this information from Chalk River Laboratories (Canada). There seemed to be an inconsistency between flow depth and river depth and ***TJS*** took notes about all of the river concerns. The document was emailed back and forth to ***LB*** and ***JS*** throughout the week for their comments and its final version provides details of the decisions from this meeting.

CM raised concerns about the location of the release, i.e.: Was everything happening on the same river bank? The location of points for the farm? Or pumping? Fishing? Additional questions were raised about location, i.e.: The axis of the pump? (***CM*** needs the complete mixing distance, in SRS-19 there is the full mixing area.) ***CM*** also raised the question of water use for irrigation: Was filtered or unfiltered water used? Do we discharge raw water?

As a group it was decided to use raw water for irrigation and animals, and to use filtered water for drinking and bathing (bathing = showering and taking bath).

CM then brought up the concern about the slope of the river. (Via email) ***LB*** tried to obtain this information but it was not available. ***CM*** managed to calculate the slope of the river using Google Earth and it was decided to use that.

CM also raised concerns regarding of the habits data: Where do the people in the scenario spend their time? How much time is spent in the garden, i.e., what was the ratio of time spent inside to outside? Do they spend all day at Herrington Bay?

AC mentioned that her model would use the river as one box.

[1] of the Health Protection Agency (UK) unable to participate in this meeting.
[2] of Health Canada (Canada) unable to participate in this meeting.

The question of which pathways WG1 should model was raised. The model being used by some participants did not have many pathways, whereas others had many pathways. The problem was resolved in two ways:

(a) most of the time the models with few pathways model the largest contributions, i.e., the other pathways are very small and don't affect the result by much; and
(b) comparisons can be made by removing the pathways that were not modelled during the analysis phase.

PK asked the question: What is harvest index? ***LB*** answered in the document that was exchanged.

CM mentioned that he would use the friction coefficient.

It was mentioned during discussions that the leaf index is not the best index for chronic releases.

IB indicated that there was an inconsistency between flow depth and river depth, which was resolved with the email exchange with ***LB***.

There was also a question about references for the dose coefficients. ***TJS*** indicated that there is a column with the references for each of the values in the template document.

VK mentioned the sediment flow rate and she would need to discuss this with ***JB***.

The topic of Tritium was brought up by ***IB***, i.e.: Which form would WG1 be modelling? It was pointed out that care must be taken because fish can change HTO to OBT (organically bound tritium). WG1 decided to only model HTO and not OBT.

Concern was also expressed with respect to the exposure factor from sediment and the units were then discussed. There was also concern that some models do not model out to 50 years, but merely out to 30 years. WG1 decided to only model to 30 years, instead of 50 years.

Discussions also took place about translocation factors.

The question was then raised regarding whether there was redundancy between "Dry fresh weight ratios for X" and the "water equivalent of planet matter". This was then resolved via email with ***LB***. It was also pointed out that the long range precipitation parameter was very high – Was it correct or is it a typo? ***TJS*** believes that the document emailed to ***LB*** resolved this.

There was also a question about what was meant by the frequency of contaminated events. Was it 105 days per year? ***TJS*** believes that the document emailed to ***LB*** resolved this.

There was a question about the "effective duration of deposition", i.e., what to make of this?

There was also a discussion about what each food meant. Did consumption of milk mean the people eat milk and milk products or just milk? WG1 decided that it would mean only the specified item, i.e., in the example above, it would mean milk only.

It was pointed out that the "incidental ingestion of soil" was very high – Was it a typo? ***TJS*** believes this was resolved by the document emailed to/from ***LB***.

Marine part of Scenario A

For the Marine part of Scenario A, parameter values were suggested by ***CM*** prior to the meeting in Kiev (21–23 September 2010). These suggested changes were subsequently discussed and implemented. ***TJS*** presented the updated results and they were much better than those presented at the Kiev meeting, i.e., instead of being many of orders of magnitude different, they were much better.

From the graphs that ***TJS*** presented, it was clear that there two different things happening. It was suggested that the water concentration between the UK and the French models be checked (because each of these results were one of the two cases in question). The results differed by about the same amount that the water concentration differed by and this explained the differences. It was discovered that the Gaussian plume marine models were more conservative, by a factor of 20, than the box models. ***CM*** pointed out that this is

very valuable information as he did not know what to expect for the differences between the two model types. Thus, the discussion about Marine results was very short.

Iodine portion of the Atmospheric part of Scenario A

TJS needs to consider this section and decipher what to do, making sure that it is in accordance with the deadlines.

TJS presented the results and kept an open spreadsheet which contained the values that WG1 asked for from the Kiev meeting.

VK mentioned that she would need to check/change her value for the deposition velocity. Some questions were directed to participants:

(a) Only dry deposition?
(b) What value do you use for deposition velocity?
(c) Is your deposition velocity the same for each radionuclide (i.e., for the scenario there is a different value for iodine than the other radionuclides).

For example, the deposition velocity was set at 1 mm/s but a couple of participants used 10 mm/s (***VK*** and ***IB***). ***IB*** changed his results and resubmitted them to ***TJS***, they were then more in line with some of the other results. ***VK*** said she would resend her results once she was got back to Belarus.

CM mentioned a question about Feeding Patterns – Do people use them? He presented his feeding pattern for cows.

There was then a question about dry weight versus fresh weight as it makes a big difference which is used.

RH resubmited his marine results and they were consequently discussed and examined in detail along with some of the other marine results. It was noticed that one of the questions was: Why is there are large green (w.r.t. to the other results) in the Co-60 results?

RH got quite different results for Cs-137 compared to our discovery of the 20 times difference between the Gaussian plume model and the box model. The difference was that ***RH's*** box model was also a dynamic model, so in his model the Cs-137 bioaccumulates, whereas France, Brazil and Ukraine's models are based on SRS-19 which is an equilibrium model. There was a large bioaccumulation effect.

CM gave a demo of Symbose and Juan Carlos Mora (CIEMAT, Spain) brienfly joined the meeting in order to give a presentation on CROM.

Outline, deadlines and actions

The task of writing the various sections of the report was discussed and distributed amongst the participants. It was agreed that the deadlines for these actions would in circulated by ***TJS***. ***VK*** will set up criteria regarding writing the section about critical group selections and ***AMBB*** agreed to analyse the results of the questionnaire.

Next meeting

The Sixth Meeting of Working Group 1 will be held 24–26 June 2011, in Hamilton, Ontario, after the International Conference on Radioecology and Environmental Radioactivity (ICRER).

WG1 MEETING AGENDA		
Monday, 24 January 2011		
09:30–13:00	Opening Plenary Session	
13:00–14:00	***LUNCH BREAK***	
14:00–15:30	Introduction and welcome	Trevor J. Stocki, WGL (Health Canada, Canada) / Diego Telleria, IAEA Scientific Secretary
	Discussion on problems with Scenario C (the river model)	All WG participants
15:30–16:00	***COFFEE BREAK***	
16:00–17:30	Discussions on problems with Scenario C (the river model)	All WG participants

Tuesday, 25 January 2011		
09:30–16:30	Discussion on problems with Scenario C (continued)	All WG participants
	Discussion of the analysis of Scenario A in terms of Iodine	Trevor J. Stocki
	Discussion of the analysis of Scenario A in terms of Christophe Mourlon's parameters	Trevor J. Stocki

Wednesday, 26 January 2011		
09:00–10:30	Plenary Session	
10:30–11:00	***COFFEE BREAK***	
11:00–17:00	Some ideas about Scenario B and discussion about paragraphs	Trevor J. Stocki
	Discussion on publications	Trevor J. Stocki

Thursday, 27 January 2011		
09:00–17:00	Tasks for writing the final report (examine outline and assign tasks)	Diego Telleria / Trevor J. Stocki
	Discussion on Sewer Modelling (do we have time?)	Trevor J. Stocki
	♣CROM – An Introduction	Juan Carlos Mora (CIEMAT, Spain)
	When to have next meeting and location	Trevor J. Stocki

Friday, 28 January 2011	
09:00–13:00	Closing Plenary Session

♣ Indicates the name of the presentation given on the WG1 web page (http://www-ns.iaea.org/projects/emras/emras2/working-groups/working-group-one.asp?s=8).