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INTERNATIONAL ATOMIC ENERGY AGENCY
AGENCE INTERNATIONAL DE L'ENERGIE ATOMIQUE
МЕЖДУНАРОДНОЕ АГЕНТСТВО ПО АТОМНОЙ ЭНЕРГИИ
ORGANISMO INTERNATIONAL DE ENERGIA ATOMICA

Third EMRAS Biota Working Group Meeting
21ˢᵗ, 22ⁿᵈ and 24ᵗʰ November 2005
IAEA Headquarters, Vienna

M I N U T E S

Attending

Mikhail Balonov (MB) (Scientific Secretariat)	IAEA
Karine Beaugelin-Seiller (BS)	IRSN, France
Nick Beresford (NB) (Co-chairperson)	CEH, UK
Justin Brown (JB)	NRPA, Norway
David Copplestone (DC)	EA, UK
Masahiro Doi (MD)	NIRS, Japan
Dong-Kwon Keum (DK)	KAERI,Korea
Sergiy Gaschak (SG)	IRL, Ukraine
Rudolf Heling (RH)	NRG, Netherlands
Jan Horyna (JH)	SÚJB, Czech Republic
Ali Hosseini (AH)	NRPA, Norway
Brenda Howard (BH) (Co-chairperson)	CEH, UK
Sunita Kamboj (SK)	ANL, USA
Alexander Kryshev (AK)	SPA Typhoon, Russia
Tatjana Nedveckaite (TN)	Inst. of Physics, Lithuania
Geert Olyslaegers (GO)	SCK-CEN, Belgium
Iolanda Osvath (IO)	IAEA-Monaco
Gerhard Pröhl (GP)	GSF, Germany
Ritva Sáxen (RS)	STUK, Finland
Tatiana Sazykina (TS)	SPA Typhoon, Russia
Jordi Vives i Batle JV)	WSC Ltd., UK
Tamara Yankovich (TY)	AECL, Canada

Note – participants may be identified by initials in minutes and action lists.

Action	Responsible	Due date
Notify Nick Beresford of suitable dates for June BWG	All (except CEH, IRSN, NRPA)	Done
Provide relevant BIOMASS reports	MB	Done @ workshop
Provide reference organism text	DC	Now on website
Revise Perch Lake reporting spreadsheet	DC	Now on website
Co-ordinate with TRS and Aquatic WG leaders re June meeting date	Nick Beresford	Workshop dates set 12-14 June 06
Tidy PowerPoint presentation of initial Perch Lake results (if required)	Tamara Yankovich	5th Dec. 2005
Confirm if ANL will run RESRAD-BIOTA for the aquatic organisms in Exercise 2	Sunita Kamboj & Charley Yu	16th Dec. 2005
Decide if ANL will run RESRAD-BIOTA for the Perch Lake scenario	Sunita Kamboj & Charley Yu	16th Dec. 2005
Agree how to model 'macroinvertebrates'	All – co-ordinated by Nick Beresford	End 2005
Revise inputs to exercise 1 and 2	Any contributor as desired	End 2005
Consider reasons for discrepancies in CR values for Cs for FW	All – see list of 'oddities' in minutes	End 2005
Revise assumption info where necessary	All	End 2005
Check text on application of reference organism concept for all models	All	End Jan 2006
Discuss data comparison with statistics experts at Westlakes	JV/NAB	End Jan 2006
Revise summary tables of assumptions and distribute	NAB	End Feb. 2006
Circulate draft of Chernobyl scenario	Nick Beresford	Mid-March 2006
Circulate Chernobyl scenario	Nick Beresford	End March 06
Input ERICA results to Exercise 1 & 2	CEH (& GSF)	End March 06
Results of Perch Lake scenario to Nick Beresford	All participating models	End April 2006
Results of Chernobyl scenario to Nick Beresford	All participating models	End April 2006
Prepare initial draft texts on exercise 1 and 2	CEH lead	Mid-May 2006
Report on potential additional scenarios	Justin Brown, David Copplestone, Sunita Kamboj & Charley Yu	June 2006 BWG workshop

Monday 21st Nov 2005 pm and 22nd Nov : discussions on exercise 1 (dosimetry) and 2 (transfer)

There was an initial presentation on FASSET and ERICA DCCs developed under EC programmes by Gerhard Pröhl. He described the approaches used in FASSET for dosimetry and the ongoing developments and improvements which will be available in ERICA in the assessment tool.

GP also briefed the group on current developments within the newly established ICRP committee 5. He reported that a sub group had been established under his chairmanship which would be comparing current approaches on biota dosimetry.

Exercise 1 – dosimetry

Prior to the meeting a set of queries had been circulated which everyone had completed showing various relevant assumptions used in their models – for two issues, geometry and radionuclides. The input had been compiled by NAB and the group discussed the various inputs and clarified where there were mistakes, or changes needed. The major differences remaining were highlighted so that we would be aware which factors may be contributing to differences in outputs of the model runs. It also identified where we may need to note differences in model assumptions in reporting results. The key differences with a significant impact on the outputs were in the assumed daughters for U-238 (whether or not U-234 was included), differences in media depths and assumed locations of biota. It was also noted that some assumptions in models are fixed and cannot be varied to fit the exercise description.

The model outputs had been compiled by NAB. He had compared outputs to the mean of the data and we further modified this to show those values which were > 1.4 above and < 0.6 below the mean. There was an obvious problem here in that the mean can be significantly influenced by outlying results and by a number of approaches sometimes using the same reference source. There was a discussion of the best way of comparing resulting estimates of internal and external dose and identifying outliers. JV agreed to discuss with statistics experts at Westlakes and MB will provide relevant BIOMASS reports addressing the same issues.

The group agreed that it was important not to focus too much on differences where doses are trivial – we need to prioritise on key dose contributions (but also highlight variables which do not impact on the result).

Participants will provide revised numbers where desired. Input from ERICA should be available by March. Although it might be expected that there should be a "correct" answer to exercise 1, it is clear that model assumptions of certain environmental factors can lead to differences in outputs which are of varying importance.

Exercise 2 - transfer

J Brown gave a presentation on different methods of deriving missing values, which is a particular problem for the transfer exercise. The group agreed that the approaches seemed reasonable and some of them are already used in the participating models.

In the previous meeting, the inclusion of derived values led to very large differences in model outputs. Therefore, in the meeting we confined our analysis to values which were not derived. Eventually, we will need to report with and without derived values. We will also need to look at the effect of the derived values – do they introduce a lot of conservatism or not (or which approaches do so). It was agreed that it was important to allow the user to know when derived values were being used.

There was surprisingly good agreement between much of the output. Some notable exceptions were identified, e.g. Cs CR values for freshwater which seemed to be influenced by accessed literature. Participants will follow up various anomalies. Input from ERICA should be available by March.

Identified anomalies included:

RESRAD-BIOTA carnivore estimates for actinides

U transfer to eggs CEH & SCK use same base data but 2-orders magnitude difference in transfer

Western European/North American estimates of Cs to fish v's Russian language values – Nordic bias in Western European data?

FASSET Cs for phytoplankton

EA R&D128 Cs for rodent

High U CRs for AECL

FASSET – high U for pelagic fish

Ra-226 – RESRAD biota low & EA high

Reference Organisms

D Copplestone provided a text summarising the approach of different models to the use of reference organisms. Everyone agreed to check the text for their models. This may subsequently provide the basis for a paper.

Reporting

The group agreed to prepare text suitable for submission to a refereed journal. This can then be adapted and extended for the final BWG report. CEH will prepare initial drafts.

Feedback on Steering Committee meeting (Weds. 23rd)

NAB reported back relevant points from the previous evenings Steering Committee meeting:

(i)   Steering Committee were agreeable to wishes of BWG for reporting format;

(ii)   Reports can be accompanied by a CD – this could contain pdfs of the original model descriptions if originators agree;

(iii)   IAEA requested that we do not hold the next workshop in May 2006 (June is OK);

(iv)   TRS WG want to co-ordinate dates for June workshop;

(v)   IAEA expect 'good drafts' of final reports to be discussed/revised at the Autumn 2007 meeting – NAB commented that the implication of this for the BWG was that the Spring 2007 meeting would be the last opportunity to present new scenario results and that we should be discussing & drafting our report at that meeting

(vi)   We had been requested to notify IAEA of the dates of our next meeting as soon as possible (by 2nd Dec. 2005).

Following this Typhoon requested that the meeting be held in conjunction with the Aquatic group meeting.

Perch Lake Scenario

TY presented the scenario as circulated prior to the meeting. RH noted that he would like to participate in the exercise with his model.

NAB asked which other models would participate in the exercise: KB reported that IRAN would run their own transfer model in combination with EDEN; JB said NRPA would consider using the ERICA CRs (when available in March) in conjunction with EPIC-DOSES3D; NAB intends to run the ERICA tool once it is available in March; SK said that ANL had not intended to run RESRAD-BIOTA within the scenario but that she would discuss with Charley Yu on her return (TY suggested that other participants could run RESRAD-BIOTA within the scenario if it was not possible for ANL to do so).

The provisional model runs were then described by participants:

ECOMOD – AK reported that ECOMOD had been run in semi-empirical mode although in future it would also be run in 'general mode'.

LIETDOS_BIO – TN described studies within Lake Druksiai the cooling pond for the Ignalina NPP. Concentration rations have been derived for Lake Drusksiai and she asked the opinion of the group as to if further participation within the Perch Lake scenario should use Lake Drusksiai derived values of literature CR values. The group replied that both would be preferable.

<u>EA R&D 128</u> – DC reported that the R&D 128 approach had been run at screening level for all Perch Lake predictions. Further work would involve trying to make more species specific predictions. He commented that it was difficult to interpret how to make assessments for the macroinvertebrates as they included a wide range of species (including both benthic and pelagic).

<u>FASSET</u> – NAB reported that FASSET had been run for selected predictions only and to date dose estimates had not been performed. FASSET does not consider ^{60}Co.

<u>AECL</u> – TY stated that she had tried to perform the assessment as she would in reality and as a consequence Perch Lake specific parameters had been used.

TY then presented a comparison of some of the initial transfer estimates for the five approaches who had submitted provisional results.

DC proposed a revised reporting spreadsheet and offered to make the agreed changes and send to NAB. AK requested that an uncertainty column be added.

It was agreed that final results would be reported to NAB by the end of April 2006 to allow collation and evaluation prior to the June 2006 meeting.

Chernobyl Terrestrial Scenario

NAB described studies conducted in association with SG during summer 2005. These involved attaching TLDs to small mammals to estimate dose rates received at three sites across a contamination gradient. Whole-body Cs and Sr results are also available and by March 2006 actinide analyses will have been conducted on some of the animals (and also some amphibian samples). A provisional scenario database was presented for discussion. With the inclusion of this summers work this would result in *circa* 60 model runs. The group agreed that this would be sufficient and requested that predictions be restricted to nuclides for which data are available in biota.

NAB agreed to circulate the draft scenario by March at the latest and all agreed to provide results by the end of April 2006.

JB described a simplified version of the FASTer model which he intends to use within this scenario.

Further Scenarios

NAB suggested that given the timetable for report preparation we are now working to it was likely that we could probably only one additional scenario. He asked if participants had any suggestions which they could present for consideration in June 2006. JB suggested the Komi case study for which data are currently being collated within the ERICA project; DC suggested sites being assessed under the Habitats Directive within England & Wales; SK offered to evaluate the possibility of using sites which have been assessed in the USA.