

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

**EMRAS II
Reference Approaches for Biota Assessment
Working Group 6
Biota "Dose Effects Modelling"**

MINUTES

**of the Third WG6 Meeting held at IAEA Headquarters, Vienna
25–29 January 2010
(during the Second EMRAS II Technical Meeting)**

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Attending	
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Mr Ali Attarilar (<i>AA</i>) (aattari@aeoi.org.ir / attarilar@yahoo.com)	Iranian Nuclear Regulatory Authority (INRA), ISLAMIC REPUBLIC OF IRAN
Mr Sohan Chouhan (<i>SC</i>) (chouhans@aecl.ca)	Atomic Energy of Canada Limited (AECL), CANADA
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*Initials used to refer to participants within minutes and actions as appropriate.

Attending	
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Meeting objectives

WG6 is interested in understanding radiological impacts to the environment. To do so requires knowledge of exposure conditions, life history characteristics of the organisms exposed, estimation of absorbed dose, derivation of dose-response relationships, and the scientific establishment of dose (dose rate) screening levels that are believed to adequately protect the environment. Much high quality work has already been accomplished in this area by prior European efforts (ERICA and PROTECT), as well as ongoing international work by the IUR and ICRP. Within the framework of EMRAS II, WG6 will build on what has already been accomplished, and work closely with the IUR and ICRP as they pursue similar objectives. Our overarching objectives are:

- Dose – Effect Modelling to Assist Environmental Risk Assessments;
- Mathematical Derivation of Screening Level Values and Biota Protection Thresholds; and
- Reach Consensus; Document Methods; Publish Guidance.

General Review

An update of progress made by WG6 was presented by **TH** during the Plenary Session, a copy of which is available for download from the Technical Meeting documentation web page (<http://www-ns.iaea.org/projects/emras/emras2/technical-meetings.htm>). Specific updates on progress made during the meeting of WG6 are provided below and details of the presentations are listed in the attached Agenda:

- (1) *Update FREDERICA Dose-Effect database* (led by **AR**): 141 additional papers were added to the FREDERICA database. All papers were subjected to a rigorous quality control analysis. 15 datasets for chronic irradiation studies and 51 datasets on acute irradiation were added.
- (2) *Develop Dose-Response Relationships and Derive Species Sensitivity Distributions* (led by **JGL**): This group will now take the updated FREDERICA database and develop dose-response

curves from homogeneous toxicity endpoints (e.g., EDR50, EDR10...). The latter will be used within species sensitivity distributions (SSDs) and the corresponding threshold protection values will be estimated. Within EMRAS II, WG6 will derive and compare SSDs for organisms that have been acutely exposed, exposed under field conditions, and for various taxonomic levels.

- (3) *Incorporate Population Models and Explore Alternative Statistical Approaches* (led by **TGS**): The majority of the WG6 meeting was devoted to the population modelling group. Presentations were made by **TGS, TH, MI, IK, AIK** and **LM**. The goal was to derive basic equations that govern population models while incorporating radiation effects, with an emphasis on finding an equation that is simple enough to be generally applicable across different species.
- (4) *Multiple Stressors* (led by **HV**): Progress was made in this group's effort to review the literature for multiple stressor data in which radiation was among the mix. Some 50 or so papers were reviewed that involve a mixture study with radiation being among the mix. This work is in conjunction with the IUR.
- (5) *Canadian Benthic Data Set* (led by **SM**): A presentation on the Canadian benthic data set derived from sediment cores taken from uranium mining areas throughout Canada was given. The data include population abundance and diversity information for benthic invertebrates. Discussion occurred on the advantages, as well as short comings of the data relative to WG6's purposes. **JGL** will now lead a group that will evaluate the data from an effects perspective. Those analyses will be presented during the next meeting of WG6.
- (6) **CM** presented the study design and methods of an alpha radiation study she is conducting on fish. The results will be pertinent to WG6.

Next meetings

The dates and location of the next (fourth) WG6 Meeting have now been agreed and the meeting will be held at IAEA Headquarters in Vienna, 6–9 September 2010 as part of a Joint Working Group Meeting with both Working Group 4 “Biota Modelling” and Working Group 5 (WG5) “Wildlife Transfer Coefficient Handbook” and Working Group 6 (WG6) “Biota Dose Effects Modelling”.

The dates of the next (third) EMRAS II Technical Meeting were announced during one of the Plenary Sessions, i.e., IAEA Headquarters in Vienna, 24–28 January 2011.

WG 6 MEETING AGENDA

Monday, 25 January 2010

09:30–13:00	Plenary Session
13:00–14:00	<i>LUNCH BREAK</i>
09:30–17:00	Attendance at other Working Group Meetings (WG4 and WG5)

Tuesday, 26 January 2010

09:00–09:15	Welcome / *First Year Progress	Tom Hinton, WGL (IRSN, France)
09:15–09:30	Population Modelling (*update)	Tatiana Sazykina (SPA “Typhoon”, Russia)
09:30–09:45	Population Model Results	Fred Alonzo (*IRSN, France) [#]
09:45–10:00	Population Model Results	Isao Kawaguchi (*NIRS, Japan)
10:00–15	Population Model Results	Alexander *Kryshev (SPA “Typhoon”, Russia)
10:15–10:30	Population Model Results	Luigi Monte (*ENEA, Italy)
10:30–11:00	<i>COFFEE BREAK</i>	
11:00–11:15	Population Model Results	Jordi Vives i Batlle (Westlakes, UK) [#]
11:15–11:30	Population Model Results	Tatiana *Sazykina (1)
11:30–12:30	Population Modelling Open discussion	Tatiana *Sazykina (2) / Tom Hinton All Participants
12:30–13:30	<i>LUNCH BREAK</i>	
13:30–14:00	*FREDERICA Database (update)	Almudena Real (CIEMAT, Spain)
14:00–14:30	Dose-Response Curves (update) Open discussion	Jacqueline Garnier-Laplace (IRSN, France)
14:30–14:50	*Ra uptake in fish (preliminary data)	Carmel Mothersill (McMaster Uni., Canada)
14:50–15:30	Open discussions/Close	Tom Hinton

Wednesday, 27 January 2010

09:00–12:00	Plenary Session	
12:00–13:00	<i>LUNCH BREAK</i>	
13:00–14:00	*Canadian Benthic Data Set (statistical approaches)	Steve Mihok (CNSC, Canada) / Jacqueline Garnier-Laplace
14:00–14:45	*Multiple Stressors (update)	Hildegard Vandenhove (SCK/CEN, Belgium)
14:45–15:00	Summary, future actions	Tom Hinton
15:00	Close	

Thursday, 28 January 2010

09:00–17:30	Attendance at other Working Group Meetings (WG4 and WG5)
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Friday, 29 January 2010

09:00–13:00	Plenary Session
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* Indicates the name of the presentation given on the WG6 web page
(<http://www-ns.iaea.org/projects/emras/emras2/working-groups/working-group-six.htm>)

[#] Not present at this meeting, represented by and/or presentation given by *TH*.

[^] This presentation is unavailable due to copyright issues.