



BIOMASS NEWSLETTER

Number 3

July 1997

BIOMASS :THE INTERNATIONAL ATOMIC ENERGY AGENCY CO-ORDINATED RESEARCH PROGRAMME ON **BIOSPHERE MODELLING AND ASSESSMENT**

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Photo 1.- Tritium Working Group Meeting in Cadarache
hosted by the CEA (France)

INTRODUCTION

As we approach the end of the first year of the BIOMASS programme it is a good time to review progress. This Newsletter contains summaries of the progress made at recent meetings of the various task and working groups of the programme and sets out plans for future activities.

This will be the last Newsletter before the October Plenary meeting of BIOMASS and so a preliminary programme for the meeting and also a registration form for attendance are included.

We look forward to seeing you again at the October meeting.

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1.- THEME ACTIVITIES

THEME 1: RADIOACTIVE WASTE DISPOSAL (REFERENCE BIOSPHERE)

The current objective of Theme 1 is to develop the concept of "Reference Biosphere" into a practical system for application to the assessment of the long-term safety of repositories for radioactive waste.

There have been a number of interesting activities and developments which have occurred in Theme 1 since the beginning of 1997. These include:

- analysis of the Theme 1 Questionnaire responses;
- organisation of a Theme 1 meeting to discuss and plan activities related to the four established, and two planned, task groups;
- development of the Theme 1 BIOMASS Information System;
- drafting a document describing the concept of Reference Biospheres; and
- interaction with two related initiatives from the IAEA and NEA.

Theme 1 Questionnaire

A Questionnaire on the technical issues of interest in Theme 1 was distributed in November 1996. The Questionnaire was divided into a general section and then specific sections related to each Task Group (TG). Since that time many organisations with either regulatory, operational or research perspectives have provided answers to the questions and these responses have been collated and analysed by each of the TG Leaders (TGLs). Any organisation can still respond to the Questionnaire if they wish to do so, please contact the IAEA Theme 1 Scientific Secretary (Carlos Torres) or the Technical Secretariat (QuantiSci Ltd).

Theme 1 Oxford Meeting

The Theme 1 meeting took place in Oxford, UK from 7 to 11 April and was attended by 41 participants representing 32 organisations from 13 countries. Details of TG discussions, together with actions and time schedules, and invited presentations are provided in the notes of the

Theme 1 meeting which is available from Carlos Torres or QuantiSci.

Task Groups

A summary of developments in each Theme 1 TG is given below. For further information contact Carlos Torres, the relevant TGL, or QuantiSci.

Task Group 1: Critical Group Principles, TGL John Kessler (EPRI). E-mail: jkessler@epri.com

Important issues for TG 1 were discussed at the Oxford meeting and participants have been asked to supply information on how they approach the topic and why the approach is adopted. Some issues of importance include: complying with regulatory requirements, conservative vs realistic assumptions, critical group parameters, critical group size in relation to contaminant release area, implications for the overall performance assessment and biosphere modelling, definition of more than one critical group according to release mechanism, assumptions for intrusion scenarios and implications of dose distributions. This TG will have important interactions with TG 3 and with the IAEA group advising on the topic of critical groups (see below).

Task Group 2: Data Principles, TGL Pascal Santucci (IPSN). E-mail: santucci@basilic.cea.fr

Following written feedback from the relevant parts of the Theme 1 Questionnaire and discussion at the meeting, a further set of questions have been circulated to participants. Work is currently underway reviewing existing documents relating to the process of data selection and the intention is to produce a set of guiding principles for data elicitation exercises. There will be important interactions with TG 6 in relation to model development for which data collation is required, and also with the IUR which has experience of large data gathering exercises.

Task Group 3: Alternative Assessment Contexts, TGL Morimasa Naito (PNC).

E-mail: naitom@pnc.go.jp

Prior to the meeting a draft document on alternative assessment contexts had been produced in collaboration with other TGLs and some

participants. This document formed the basis for discussion at the meeting and input from participants will be included in a revised version. A questionnaire about the geosphere/biosphere interface has been distributed and responses have been analysed. Currently information is being gathered on how assessment endpoints influence models. A new draft of the Alternative Assessment Context Document, incorporating Oxford meeting outcomes and PAAG/NEA suggestions has been produced. The document has been distributed among active participants.

Task Group 4: Biosphere System Identification and Justification, TGL Marianne Menut (ANDRA). E-mail: Marianne.Menut@andra.fr

A note summarising responses to the relevant questions in the Theme 1 Questionnaire and proposing an approach to identify and justify biosphere systems was distributed in advance of the Oxford meeting. A new version of the Questionnaire summary has now been circulated for further comment. A key topic of interest is the representation of biosphere change and everyone with an interest in the subject has been asked to provide information on approaches used so that this information may be included in a draft TG 4 report which will be distributed at the end of July 1997.

Task Group 5: Biosphere System Description, TGL Paloma Pinedo (CIEMAT). E-mail: pinedo@ciemat.es

The main work of this TG will not begin until after the October meeting. However the TGL gave a presentation at the Oxford meeting and interested participants have been asked to think about how to define the spatial domain and relevant ecosystems, how to ensure consistency with human communities and how to ensure consistency with the overall performance assessment.

Task Group 6: Biosphere Modelling, TGL Mike Egan (AEA Technology). E-mail: mike.egan@aeat.co.uk

This TG has not started work yet, but the TGL asked people to think carefully about the important interactions with TGs 2, 3 and 5. Often

biosphere models have been developed prior to selection of a specific disposal site, gathering of site specific data or statement of the assessment context. The implications need to be considered.

BIOMASS Theme 1 Electronic Information Systems

A BIOMASS Theme 1 Information System (BIS) is being set up for use by Theme 1 participants. The BIS will encourage technical debate between participants on draft documents and enable the rapid electronic exchange of technical information. It is currently being tested and used by the BIOMASS Theme 1 Steering Committee, the TGLs, Scientific Secretary and Technical Secretariat. It is planned that it will be fully operational for all Theme 1 participants after the Plenary Meeting in October 1997.

Reference Biospheres Concept Document

It is intended to publish a document on the Reference Biospheres Concept in order to explain to the wider performance assessment community and other interested parties the work being undertaken in Theme 1. Prior to the Oxford meeting, a draft paper was prepared by all the Theme 1 TGLs, the Scientific Secretary and Technical Secretariat. Following input from participants at the meeting and written comments being submitted up to the middle of June, there has been another drafting meeting in Vienna to progress the document; further comment and discussion will be invited at the Plenary meeting in October 1997.

Related Initiatives

In parallel with the work of BIOMASS Theme 1, there have been two other related initiatives. The first has come from another IAEA group which has produced a draft paper on critical groups and biospheres, with the focus on radiation protection rather than performance assessments. The second initiative has come from the Performance Assessment Advisory Group (PAAG) of the Nuclear Energy Agency (NEA) which has produced comments to the BIOMASS theme 1 programme. A simple groundwater-drinking calculation is recommended as a reference point. BIOMASS Theme 1 participants have been

invited to provide comments, so that considered opinions can be provided to the IAEA and PAAG on these two topics of interest.

Comments and questions should be addressed either to the Working Group Leaders or to the Scientific Secretary:

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 E-mail: C.Torres@iaea.org

or to QuantiSci Ltd, Technical Secretariat,

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THEME 2: ENVIRONMENTAL RELEASES

The objectives of Theme 2 are to provide an international forum for activities aimed in increasing the credibility and confidence in methods and models for the assessment of radiation exposure related to environmental releases.

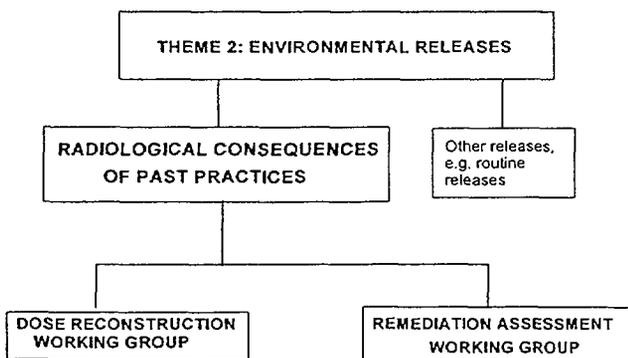


Figure 1. Theme 2 organisation

Currently two working groups in Theme 2 are active: Working Groups on Dose Reconstruction and Remediation Assessment. Both groups held a meeting in June 1997 at Mol, Belgium, hosted by SCK/CEN.

Remediation Assessment Working Group Meeting, WGL Theo Zeevaert.

At the initial BIOMASS meeting in October 1996 in Vienna the Remediation Assessment Working Group adopted the "Olen Scenario" for its first modelling exercise. The modelling task concerns remediation at a radium extraction site. It consist of two scenarios, a type A and a type B scenario, as described in BIOMASS Newsletter 2.

The group met from 9-10 June 1997 in Mol. The preliminary results of Type A scenario modelling predictions were discussed and some need for additional information was identified. The Group still invites interested modellers to join the exercise. The amended scenario will be mailed within one month to all modellers who have earlier expressed their interest but were not able to contribute to the present meeting. The final discussion on the type A scenario results will be held in connection with the BIOMASS plenary meeting in October.

In connection with the Remediation Working Group Meeting, a visit to the Olen site was organized. After an interesting introduction to remediation work carried out in Olen site the Group had the pleasure of visiting the old and new banks of the Bankloop Brook and the nearby fields and of following with a dose rate meter the patchy ²²⁸Ra contamination of the area.

Dose Reconstruction Working Group Meeting, WGL Kathleen Thiessen

Following the Remediation Working Group Meeting, the Dose Reconstruction Working Group met in Mol 11-13 June 1997. The work programme of the meeting was analogous to the previous one. The Scenario concerned is the Iodine-131 release from the Hanford site in 1963 as described in BIOMASS Newsletter 2. Comparison of modelling results awoke fruitful discussion and minor gaps in scenario data were identified. A preliminary layout of the scenario

report was discussed.

It is still possible to join the modelling of the Hanford Scenario. As in the case of the Olen Scenario, those who have shown their interest in modelling the Hanford Scenario, will receive the amended scenario in about one month.

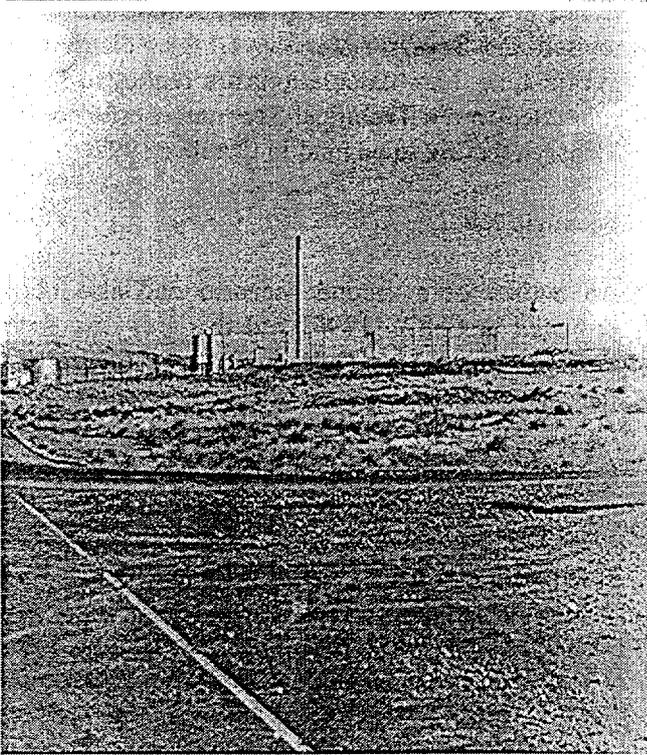


Photo 2.- The PUREX plant at the Hanford Site, with its 60 meter stack, point of the release for the Hanford Scenario

If you are interested in modelling either the Olen or Hanford scenarios but have not received the scenario descriptions and data please contact the Scientific Secretary:

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New Theme 2 Scenarios

At the BIOMASS meeting in October 1997 both the Remediation Working Group and Dose Reconstruction Working Group will pay attention to selection of the next test scenarios. In the case of the Remediation Group, the actual modelling of a new scenario will start only next year because the Olen scenario already contains two modelling tasks. At the first BIOMASS meeting a scenario related to lake remediation in the Bryansk Region in Russia was presented. The lake was contaminated with ^{137}Cs during the Chernobyl accident. The modelling task has now been amended with a second lake experiment, a lake situated in Urals and contaminated with ^{90}Sr in 1957. A second candidate for the next scenario is related to the remediation of the Techa River, in Urals, which was contaminated mainly in 1949-1952 with a mixture of fission products, the most important being ^{90}Sr and ^{137}Cs .

In the case of the Dose Reconstruction Group the modelling of the second scenario will be started by the end of this year and the first results are planned to be discussed at the next working group meeting scheduled in May-June 1988. A short summary of each of the proposed scenarios (Techa River in Russia, Pripyat River Flood-Plain in Ukraine, Iput River in Russia and Fernald in Ohio, USA, cf. BIOMASS Newsletter 2) will be distributed together with a questionnaire on potential interest in September and a decision on the scenario selection will be made at the BIOMASS Plenary Meeting in October.

Comments and questions related to the work of Dose Reconstruction Working Group and Remediation Assessment Working Group should be addressed to the working group leaders, Kathleen Thiessen and Theo Zeevaert, respectively, or to the Scientific Secretary Kirsti-Liisa Sjoebloom.

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THEME 3: BIOSPHERE PROCESSES

Tritium Working Group, WGL Yves Belot (IPSN)

The BIOMASS Theme 3 Tritium Working Group (TWG) has been very active over the period from January to July 1997. The Group has had a meeting and participants have started defining two different scenarios and producing calculations to test and compare models and modelling approaches.

TWG Meeting

The TWG meeting was held in Cadarache, France from 22 to 24 April 1997 hosted by the CEA, and was attended by 24 people from 15 organisations and 9 countries. The meeting objectives were to:

- discuss preliminary results for Scenario 1 and refine the scenario description;
- plan Scenario 2;
- exchange information on potential sources of experimental and field data for model validation; and
- develop a future work plan.

A summary of work activities and time schedules was developed at the meeting. These have been provided in the notes of the TWG meeting which have already been distributed, together with copies of the Scenario 1.0 calculations and presentations. Anyone else who would like a copy of the meeting notes should contact the IAEA Scientific Secretary (Yoshikazu Inoue), or the Technical Secretariat (QuantiSci Ltd).

Scenario 1.0 Calculations

An IAEA document which described the TWG scope, objectives and approaches had been distributed at the end of 1996 [IAEA, 1996]. This

document included a Scenario 1.0 description and participants were requested to submit their first set of calculations prior to the TWG meeting. A total of 9 sets of calculations were submitted for providing estimates of tritium concentrations in atmospheric water, soil water, plant water and groundwater following an assumed constant atmospheric release. Following discussion of results at the TWG meeting, the scenario has been revised and Scenario Version 1.1 was distributed in mid-June. New calculations are requested to be submitted to the Technical Secretariat prior to the Plenary meeting to be held in October 1997.

Scenario 2.0

An outline of a second scenario had also been provided in IAEA [1996] and this was discussed during the meeting. Scenario 2.0 will investigate the dynamic aspects of tritium transport at a theoretical site where atmospheric releases have ceased and the source term is a shallow aquifer with constant groundwater concentrations. At least 2 phases of calculations are envisaged. The first phase will use this simple source term, a bare soil (ie, no plants), with generic sandy loam soil characteristics, and a real meteorological data set. Phase 1 calculation endpoints will be tritium soil profiles and aquifer concentrations and soil re-emission rates to the atmosphere at three monthly (ie, quarterly) intervals to correspond with the four seasons for a period of a few years after the end of atmospheric releases. Subsequent phases of the calculations will assume more complex environment characteristics (eg presence of plants).

Since the meeting, soil, meteorological and other information for the second scenario has been collated and Scenario 2.0 will be distributed for comment at the end of July 1997.

Experimental and Field Data

Participants from the University of Hanover (Germany), Imperial College (UK) and the CEA/DASE (France) summarised tritium experimental and field sampling work that had been undertaken at their institutions over the last few years. Field and experimental data have also been collated by colleagues in Russia and Canada. All participants are giving consideration to how

such data might be used for future model testing exercises or to help with validation of the two current scenarios.

Reference: IAEA (1996). International Programme on Biosphere Modelling and Assessment Methods (BIOMASS). Theme 3: Biospheric Processes. Tritium Working Group Scope, Objectives and Approaches. 1996-12-20. IAEA, Vienna.

Important Information

NOTE 1: Please note that as from 1st July 1997 the address, telephone and fax numbers for Dr. Yves Belot (Tritium Working Group Leader) will be as follows:

Dr. Yves BELOT
40 rue du Mont Valerien
F-92210 Saint-Cloud
France
Tel: +33 1 4771 0885
Fax: +33 1 5557 0476

NOTE 2:

The tritium working group is looking for additional sponsors to help participants actively involved in modelling and experimental work for the BIOMASS programme to attend working group meetings but who have difficulties finding travel expenses. If your organization is able to offer support, please contact either the Scientific Secretary, or the Technical Secretariat, Scientific Secretary for the WG,

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or to QuantiSci Ltd, Technical Secretariat,

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Fruit Trees Modelling Working Group

A preparatory meeting will be held in Vienna, 8-10 September 1997. Its purpose is to organize activities and prepare a document describing the technical content and workplan.

This working group will be launched during the October BIOMASS meeting.

Proposals for BIOMASS Theme 3 additional topics

Proposals for additional topics to be considered in Theme 3 can still be made. The proposals can be addressed to:

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2. FORTHCOMING EVENTS:

The next BIOMASS Plenary meeting will be held at the IAEA Headquarters in Vienna 20-24 October, 1997.

PROVISIONAL MEETING AGENDA

OPENING SESSION : Summary of BIOMASS progress in each Theme.

WORKING SESSIONS

Theme 1 working sessions and Biomass Theme 1 Steering Committee Meeting (Reference Biosphere).

Theme 2 working sessions

- Dose Reconstruction Modelling
- Remediation Modelling

Theme 3 working sessions

- Tritium Modelling
- Fruit Trees Modelling

SPECIAL SESSION: IAEA RADIOLOGICAL ASSESSMENT PROJECTS

- Radiological Study of the nuclear test sites at the Mururoa and Fangataufa Atolls
- Radiological Conditions at Bikini Atoll: Prospects for Resettlement
- Radiological Conditions at the Semipalatinsk Nuclear Test Site in Kazakhstan
- Conclusions of the International Arctic Seas Assessment Project (IASAP)

PRESENTATIONS:

- Additional proposals
- Reviews of other relevant (non BIOMASS) studies

CONCLUDING SESSION: Presentations summarising the work done and future plans

BIOMASS Co-ordinating Committee Meeting

**3.- REGISTRATION FORM FOR THE SECOND BIOMASS RESEARCH
CO-ORDINATION MEETING AT IAEA HEADQUARTERS, VIENNA,
20-24 OCTOBER, 1997**

**IAEA CO-ORDINATED RESEARCH PROGRAMME ON BIOSPHERE MODELLING AND
ASSESSMENT METHODS (BIOMASS)**

Please could you fill in this form and send it to the Scientific Secretary (details given below) as soon as possible (please no later than 15 September, 1997):

YES, I will attend to the meeting.....	<input type="checkbox"/>
THEME 1	<input type="checkbox"/>
THEME 2	
Dose Reconstruction WG	<input type="checkbox"/>
Remediation WG	<input type="checkbox"/>
THEME 3	
Tritium Modelling WG	<input type="checkbox"/>
Fruit Trees Modelling WG	<input type="checkbox"/>

My personal data and address are:

Name:
Organisation:
Address:
Telephone:
Fax:
e-mail:

Carlos Torres
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