



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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November 5, 1999

MEMORANDUM TO: C. William Reamer, Chief
High Level Waste and Performance Assessment Branch
Division of Waste Management, NMSS

THRU: Keith I. McConnell, Section Leader *SW for*
Performance Assessment and Integration Section
High Level Waste and Performance Assessment Branch
Division of Waste Management, NMSS

FROM: Christopher A. McKenney, System Performance Analyst *CA*
Performance Assessment and Integration Section
High Level Waste and Performance Assessment Branch
Division of Waste Management, NMSS

SUBJECT: MEETING SUMMARY OF INTERNATIONAL ATOMIC ENERGY
AGENCY BIOSPHERE MODELING AND ASSESSMENT PROGRAM'S
WORKING GROUP

From August 30th to September 3rd, 1999, the U.S. Nuclear Regulatory Commission (NRC) held a working group meeting for the International Atomic Energy Agency's (IAEA's) program on Biosphere Modeling and Assessment Methods (BIOMASS). The BIOMASS program is focused on improving current modeling methods and developing a methodology that can be used to establish reference biospheres and critical groups for long-term performance assessments that are both reasonable and transparent. Fifteen participants from 6 countries (see attachment) worked throughout the week on generic biosphere examples the program is using to test the various portions of the methodology that have been developed. This week's generic examples centered around modeling releases from the geosphere directly into the natural environment and how to incorporate biosphere change that is caused by major processes such as climate change. Previous working group meetings have focused on examples involving a well as the method of transferring radioactive releases from the geosphere to the biosphere. Documents detailing the methodology and the examples will be published by the IAEA over the next year. At the October annual plenary meeting of BIOMASS, the IAEA will release a working document on the identification of critical and other exposure groups.

BIOMASS is a six-year effort that focuses on three main areas or "themes": 1) radioactive waste disposal, 2) environmental releases, and 3) biospheric processes. BIOMASS had its initial meeting in October 1996, in Vienna, Austria. The NRC has been previously involved in BIOMASS Theme 1 and its non-IAEA predecessor, Biosphere Modeling and Validation Studies (BIOMOVS II). Theme 1 of BIOMASS is focused on implementing and improving the Reference Biosphere Methodology developed in BIOMOVS II. The IAEA's BIOMASS program provides an avenue to explore the issues, attempts to reach international consensus on reasonable approaches, and affords NRC an opportunity to influence the outcome of this work, which will be used as an international reference. NRC has generally focused on activities in Theme 1, because of the importance of these specific issues in developing Part 63 and guidance for the License Termination Rule.

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An integral part of the program is the use of examples to test the methodology (see Table 1), and the focus of this working group meeting was a continuation of exercising the methodology through the use of progressively more complex examples. The key objectives of the meeting included:

- Finalization of the Task Group 2 data report;
- Finalization of the Example 1A/B document;
- Development of alternate states input for Example 2A-boreal biosphere system description;
- Development of biosphere identification and justification for Example 3A, with specific focus on dealing with the biosphere change; and
- Conceptual and mathematical model development for Example 2A-temperate.

Example	Short Description	Notes
Example 1 - Drinking Water Well	Water well intruding into a contaminated aquifer used to supply drinking water only. This example was divided into two separate subexamples: A) water concentrations at the wellhead were given, and B) release rates into the near-surface aquifer were given.	Final Draft agreed to during meeting. A working document detailing the example should be released at October Plenary meeting.
Example 2 - Agricultural Scenario	These scenarios assume use of contaminated material in an agricultural setting. Two basic subexamples were generated: A) water concentrations at the wellhead were given, and B) release of radionuclides from the geosphere model occurred directly into the near-surface environment (e.g., into a marsh, stream, lake, etc.).	At Madrid, it was discussed whether to evaluate Example 2A under two different climate states (temperate and boreal). Members proceeded with completing Example 2A - temperate at the Madrid meeting. At this meeting, it was decided that participants would put aside the boreal state to investigate the implications of Example 2B.
Example 3 - Biosphere Change	Example 3 explores the implications of biosphere change during the period of the assessment. Again, the example was divided into two subexamples: A) initially, the community used contaminated well water, and B) initially, radionuclide releases were directly into the surface environment.	This work was just started during this week's meeting. It is highly doubtful that BIOMASS will explore fully both subexamples.

Table 1. BIOMASS Examples

Overall, the meeting was quite productive and most of the key objectives were met. Unfortunately, because of a job change, the individual in charge of the Task Group 2 data report was unable to attend the meeting. However, discussions with other Task Group 2 members present allowed the document to be substantially finished. Additionally, at the beginning of the meeting a decision was made to investigate Example 2B rather than Example 2A-boreal, because there was more interest by participants, and Example 2A-boreal would not test the methodology to any greater extent than Example 2A-temperate. For most of the last three days of the meeting, parallel sessions were held to investigate Example 2B and Example 3A.

As part of the closing activities, the participants identified tasks that needed to be completed either prior to or at the October 4-8, 1999, plenary meeting in Vienna, Austria. These included final drafts of Task Group 2's data report and the documentation of Example 1; a first draft of the documentation of Example 2A should be substantially completed by the end of the meeting; additional work would be done on Example 2B and Example 3A; and a working document would be released on identifying critical and other exposure groups.

Attached: List of Attendees

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- Conceptual and mathematical model development for Example 2A-temperate.

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LIST OF ATTENDEES

Marianne Menut-Calvez, ANDRA, France
Walter Van Hecke, ANDRA, France
Carlos Torres-Vidal, IAEA
M. Naito, PNC, Japan
Ulrik Kautsky, SKB, Sweden
Almudena Aguero, Ciemat, Spain
Ryk Klos, Aleksandria Sciences, UK
Ben Walters, MAFF, UK
Ian Crossland, NIREX, Ltd., UK
Peter Coughtrey, Mouchel Consulting Ltd., UK
Michael Egan, Quantisci, Ltd., UK
Graham Smith, Quantisci, Ltd., UK
John Kessler, EPRI, USA
Christopher A. McKenney, NRC, USA
Jeff Tappen, SAIC, USA

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