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DELIVERABLE D7a: First EUG Event - Part 1: Discussion of ERICA Workplan

Author(s): **Deborah Oughton, Irene Zinger, Ingrid Bay, Peer Børretzen, Jacqueline Garnier-Laplace, Carl-Magnus Larsson and Brenda Howard**

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ERICA (Environmental Risk from Ionising Contaminants: Assessment and Management) will provide an integrated approach to scientific, managerial and societal issues concerned with the environmental effects of contaminants emitting ionising radiation, with emphasis on biota and ecosystems. The project started in March 2004 and is to end by February 2007.

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Project Coordinator: **Swedish Radiation Protection Authority**

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Foreword

This report provides a transcript of the First EUG Event – Part 1: "Discussion of ERICA Workplan", in which the End-Users Group (EUG) provides feedback to the ERICA work-plan, together with responses to EUG comments and suggestions from the ERICA Consortium.

During the meeting, the ERICA Work Package (WP) Leaders gave an introduction to their respective plans and deliverables. Both ERICA Consortium participants and EUG members were present during the presentations and plenary sessions.

Since these were based on the publicly available Technical Annex (sent to all EUG members and available from www.erica-project.org), the description of the ERICA plenary presentations in this document is restricted to a brief overview and highlights of any changes and/or developments from the Technical Annex. Following these presentations, the EUG evaluated the plans in group discussion sessions (two groups), then presented their comments to the ERICA consortium in plenary.

Where possible, the ERICA WP Leaders and Consortium members tried to answer questions or respond to comments during the plenary discussion. We have endeavoured to ensure that all EUG comments and suggestions have been included and reproduced accurately in this document, and drafts have been sent to the EUG members present during discussion for comment. In some places, the ERICA members have tried to provide more detailed responses than those provided during the plenary discussion.

The report concludes with a summary of the main points raised by the EUG, together with the action to be taken by the ERICA Consortium.

ERICA Consortium presenters	**EUG members**	
	Group 1	**Group 2**
Carl-Magnus Larsson (co-ordinator, CML)	Kjell Andersson [a]	Frank Bruchertseifer [l]
Per Strand (WP1 leader, PS)	Simon Caroll [b]	Nava Garisto [j]
Jacqueline Garnier-Laplace (WP2, JG-L)	Mary Clark [c] (Chair WP1/2)	Kathryn Higley [k] (Chair)
Irene Zinger (WP3 leader, IZ)	Celia Jones [d]	Arthur Johnston, [l]
Brenda Howard (WP4 leader, BJH)	Neale Kelly [e]	Didier Louvat [m]
Deborah Oughton (EUG leader, DHO)	Steve Mihok [f] (Chair WP3/4)	Tim Parker [n]
Secretary/facilitation (external)	Carmel Mothersill [g]	Jill Sutcliffe [o]
Graham Smith (Enviros)	Jan Pentreath [h]	Brettaina Walker [p]

EUG: **a**, Karinta Konsult; **b**, Greenpeace international; **c**, U.S. Environment Protection Agency; **d**, Kemakta Kemakta Konsult AB; **e**, independent expert; **f**, Canadian Nuclear Safety Commission; **g**, McMaster University; **h**, International Commission on Radiological Protection; **i**, German Federal Office for Radiation Protection; **j**, SENES Consultants Ltd; **k**, Oregon University; **l**, Australian Radiation Protection and Nuclear Safety Agency; **m**, International Atomic Energy Agency; **n**, British Nuclear Fuels; **o**, English Nature; **p**, World Wide Fund – Artic Branch.

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1 General Introduction – Carl-Magnus Larsson (CML)

1.1 Presentation

The presentation focused on the transition from the FASSET project, which covered the impact assessment framework (i.e. from source term to assessing radiation effects in individual organisms) to the ERICA integrated approach, which will include risk characterisation, management and decision-making guidance. A general overview of the planned EUG meetings, their expected dates, locations and subject areas was also given.

1.2 EUG feedback

PLENARY COMMENT (Jill Sutcliffe): Why not invite EUG from new member states?

RESPONSE (DHO): They were invited to this meeting, but our new Member State participants did not prioritise or could not make it to this meeting.

CML: The EUG list may also change in the future as new interested potential members are identified, including representatives of organisations within Member States. Furthermore, the Consortium just agreed to hold one of its EUG events in a new Member State, if feasible.

2 The Day's Schedule and Procedure – Deborah Oughton (DHO)

2.1 Presentation

A general overview was provided for EUG discussion procedures for both the ERICA workplan and, briefly, the thematic meeting to take place the following day. The procedure for the first day was as follows.

> Each WP leader gave a plenary presentation of the workplan, followed by short questions of clarification. Two breakout group discussions occurred during the day: the first to discuss WPs 1 and 2, and then WPs 3 and 4. For the ERICA workplan discussions, the EUG members were split into two groups, without ERICA participants. Both groups discussed all WPs. Following each breakout session, the groups reported their conclusions in plenary to ERICA participants, after which a discussion took place and further comments/questions from the floor were taken. For the thematic discussions, taking place the next day, the EUG and ERICA participants were mixed.

An important procedural point highlighted during the presentation was that the EUG breakout discussions were "closed". *What* was said would be reported, but *who* said it would not. For this part of the dialogue, EUG members could chose to represent themselves or their organisations; EUG participants would not be permitted to attribute an opinion or information submitted by *another* participant during discussion.

2.2 EUG Feedback

This feedback is taken from the EUG group discussions of WPs 1 and 2, since these comments are directly relevant to the procedural aspects.

GROUP 2 COMMENT: Anonymity is neither necessary nor desirable.

DHO: This condition is only intended to apply for a part of this EUG dialogue procedure. There will be plenty of opportunity for EUG participants to make their own views publicly known during other communication interactions. It is a standard procedure for stakeholder dialogue, sometimes referred to as Chatham House Rule(s), and its advantages are widely recognised.

GROUP 2 COMMENT: Would have liked access to WP leaders during discussion.

DHO: The EUG will get this in later discussions. For this particular EUG evaluation we wanted to encourage a very general discussion of the whole workplan. We did consider having WP leaders "on call", but, given the time limits, we thought that it was more productive to wait until the plenary sessions. The Consortium will try to follow this advice for future meetings.

GROUP 2 COMMENT: Why split the EUG in two pre-determined groups? The discussion might have been better with all members present.

DHO: Having two groups has a number of advantages. It helps to identify points on which there is consensus—namely conclusions reached independently by both groups; gives a broader evaluation—more issues may be covered; and shows where there may be disagreement—for example, if the groups come to different conclusions. Also, 16 participants (i.e. total number of EUG members invited) exceeds the optimum number for group discussions.

3 Work Package 1: Assessment Tools – Per Strand (PS)

3.1 Presentation

The presentation gave an overview of the objective, main tasks and milestones of WP1. Some planned initial EUG interactions such as feedback on scenarios of interest and input/output requirements, and the possibilities to provide beta versions and have a user forum on the ERICA website were presented. An initial module and look-up table based program structure was presented together with an example using prototype software. A possible graphical output structure was shown setting the output from the model in relation to known-dose effect relationships provided by the FRED database.

3.1.1 Questions of clarification (answered by PS)

- Regarding dose presentation, will you distinguish the contribution from source term of interest plus the other ambient? YES, WE WOULD LIKE THE TOOL TO HAVE A FLEXIBLE OUTPUT WHERE THE USER CAN CHOOSE HOW AND WHAT TO PRESENT.
- Will the tool be applicable to short term release or chronic releases? BOTH, BUT THERE WILL BE SOME LIMITATIONS REGARDING SHORT-TERM AND FLUCTUATING SITUATIONS AS THE FASSET FRAMEWORK, SO FAR, IS BASED ON EQUILIBRIUM TRANSFER FACTORS.
- What is the procedure for QA/QC on the articles used in the database? WE RECORD TRACEABILITY AND USE EXPERT JUDGEMENT.

- How is the framework related to protection of man? THE TERM “REFERENCE ORGANISM” CAN BE RELATED TO THE TERM “REFERENCE MAN” AND THE FRAMEWORK USES MANY CONCEPTS FROM THIS APPROACH.
- Do you have guidance to users on temporal and spatial averaging, e.g. for instantaneous/point release? WE WILL TRY TO INCLUDE USER FRIENDLY GUIDANCE ON HOW TO HANDLE VARIOUS SCENARIOS INTO THE SOFTWARE, PERHAPS THROUGH TUTORIALS OR WIZARDS.
- How will you define harm? There can be effects without harm. THIS IS A CHALLENGE - THE TERM IS COMPOSED OF MANY COMPONENTS – HOWEVER, IT IS IMPORTANT TO REMEMBER THAT THE TOOL WILL AID DECISION MAKERS, NOT MAKE THE DECISIONS FOR THEM.

3.2 EUG Group discussion feedback

GROUP 1

- It is clear that the Assessment Tool follows FASSET, technically, but you need to set out the drivers for why you are doing this.
- Despite having all this information, one cannot avoid professional judgement.

GROUP 2

- The communication of the basis for selection of organisms or scenarios needs to be very transparent early in the process (e.g. why is a bird like an ovoid spherical entity).
- Need clear mechanisms for updating databases, procedures etc. based on new knowledge.
- The tool is not just a risk management tool, but also a risk assessment tool, so while conservatism needs to be kept in the whole process, should be realistic in higher tiers.
- Need to address both transient and steady state conditions. Steady state is easy but insufficient. Scenarios for evaluation should include both chronic and upset (e.g. spills, accidents, intermittent or infrequent situations).
- Guidance on dealing with the spatial scale may be beyond WP1 but should be considered somewhere within ERICA.
- Code development: i) standardised input/output for linking to other favourite codes; ii) end-user involvement must be constant in the process; iii) need list of output and input parameters; iv) what will be presented as probability distribution functions (pdfs)? Dose conversion factors or more?; v) the output should decide how the degree of realism is driving the assessment (i.e. are all data extrapolated from other species and other nuclides); vi) need to recognise that the code will likely be used in reverse engineering (i.e. doses will be used to back calculate consideration levels).

3.2.1 General response (PS)

When FASSET ended many interesting challenges were still laying ahead. ERICA aims at developing an integrated approach for guiding decision-makers based on scientific judgement. The Assessment tool developed under WP1 will be a tangible product of the project that hopefully will be useful for end-user wanting to implement the framework. But as was said earlier, the tool is not intended to make decisions, rather to guide decision makers.

Traceability is an important part of the FASSET framework, there has also been an objective to make the framework as transparent as possible by motivating choices and basing them on a set of criteria that was selected at the start of the FASSET project.

Erica is building on default parameters for most simple assessments, however users will also be able to use their own (e.g. site-specific) data. We will look at various options on accomplishing this. One option would be to make the tool based on tiers, starting with simple models using conservative parameters and a minimum of input, but also allowing the user to use own transport models (and use this output as input into the assessment tool), and edit parameters. We are looking on the possibility to base the assessment tool on "sessions" where all parameters and settings specified by the user can be saved, open, and edited later on. Constant end-user involvement is very important to make this software a successful tool. One way to involve end-users is to establish a user forum on the ERICA web-site and to publish beta-versions of the software.

The software will try to cover both steady state and transient conditions. Steady state, is relatively straight forward to implement. Transient conditions are more difficult to implement, partly due to the inherent limitations of equilibrium based look-up tables from the FASSET framework. Uncertainty management will be implemented in the tool. We want to implement the uncertainty estimates on as basic level as possible (i.e. uncertainties attached to each parameter), but this will depend somewhat on knowledge gaps. The user should however be able to choose among various pdf's to attach to user defined data. The programme structure will be flexible enough to allow "reverse engineering" to be easily implemented, whether this is a desirable option has to be decided later.

3.2.2 Plenary Discussion

NEALE KELLY: Be clear what is it that you are developing. From most of your descriptions it looks like a research tool. But actually it is supposed to be an operational tool.

RESPONSE (PS): The tool will in "default mode" be based on default parameters for making simple assessment with a minimum of input, but also be flexible enough to accept user-defined input for most parameters when more comprehensive assessments are required. (CML) The Consortium specified the tool, and included the end users/researchers.

4 Work-Package 2: Risk Characterisation – Jacqueline Garnier-Laplace (JG-L)

4.1 Presentation

The presentation focussed on the transfer from FASSET to ERICA, and in particular on the risk characterisation stage as the final stage in any Ecological Risk Assessment (ERA) exercises. Uncertainty was pointed out as a major component of risk estimation. The WP2 workplan and sub-task leaders were presented. This consists of three tasks: 1) Risk characterisation methodology led by SUC; 2) Extrapolation issues led by IRSN; and 3) Good practice guidance led by EA. The main outline of the first deliverable for WP2 (D4: Risk Characterisation Methodology) was presented. It was underlined that the critical review of existing frameworks will be ready as a draft for discussion during the next EUG meeting in September 2004. Concerning extrapolation issues, an overview was given on theoretical aspects with a focus on the possibilities offered by the application to effects data of statistical techniques, such as Species Sensitivity Distributions (useful to extrapolate from one species to another). A brief presentation was given on the experimental developments. It was stressed that the

main purpose of experimental studies was not to fill specific knowledge gaps, but to establish robust methods for extrapolation from individuals to populations; and to confirm, or not, a number of hypotheses used when extrapolating from external irradiation to internal irradiation.

4.1.1 Questions of clarification (answered by JG-L)

- Is one of the deliverables on Probability Distribution Functions (PDFs)? YES, OF A VARIETY OF TYPES. THESE WILL BUILD ON A NUMBER OF DOSE-EFFECT RELATIONSHIPS, FOR EXAMPLE EC_{10} AND PDF. THIS IS SIMILAR TO ECOTOXICITY MANAGEMENT FOR CHEMICALS, BUT NEEDS ADAPTATION.
- Why not benthic invertebrate? Why Daphnia? DAPHNIA HAS GOOD INFORMATION, OECD HAS REPRODUCTION TESTING. IT ALSO ALLOWS COMPARISON OF SEXUAL AND ASEXUAL REPRODUCTION.
- How do you choose radionuclides? BASED ON EXTERNAL + INTERNAL EXPOSURES. THE FULL EXPERIMENTAL PROTOCOL WILL BE DECIDED IN JUNE 2004.
- Literature is full of underestimates of uncertainty. What mechanism for managing this bias? THIS IS DESCRIBED IN DETAIL IN THE TECHNICAL ANNEX.

4.2 EUG Group discussion feedback

GROUP 1

- The key issues are good and we are looking forward to good practice guide and handbook. May offer input.
- Why not extrapolation to other plants/animals?
- How will the experiments be carried out?
- Upon what criteria have the laboratory/experimental animals been chosen?
- Why earthworm and another organism? Better to focus on one!
- What about longer-lived animals, how can you deal with elephants in a three-year programme?

GROUP 2

- The basis for selection of experimental organisms needs to be transparent.
- Took exception to *Daphnia*, wanted benthic organisms as well.
- Need clear rationale for the choice of nuclides for experiments (e.g. tritium, carbon-14, polonium, exotics). EUG would like input on these choices.
- Early consultation of how to develop probability distribution functions (pdfs) of weighting factors or other important parameters.
- Clarity is needed in the risk characterisation endpoints (e.g. what endpoints? morbidity, mortality, genomic instability??reproduction, or mutation).
- Would be useful to produce a shopping list of research topics.

4.2.1 General Response (JG-L)

Management of parameters and uncertainties

Within the deliverable D4, management of uncertainties associated to the exposure analysis, to the effect analysis and to the final probabilistic risk distribution will be reviewed, obviously in strong connection with developed tools in WP1. Within D5 (Extrapolation Methodology), Species Sensitivity Distributions will be applied, with the aim to obtain synthetic knowledge used to systematically examine on a statistical point of view the following issues:

- to compare the sensitivity of different species to toxic effects of ionising radiation within each wildlife group distinguishing acute and chronic exposure regimes; for each wildlife group, to compare the sensitivity of the four umbrella endpoints;
- to clearly identify and prioritise data gaps in terms of toxic effects, in particular those limiting confident conclusions in terms of derivation of EQSs (e.g. "Hazardous Dose(rate)" for 5% of species) devoted to radionuclides; to have a synthetic view on the representativity and on the quality of data available to derive these EQSs.
- for the risk characterisation endpoints, this will be a major output to include into D6.

Selection of test organism

Broadly speaking, within the initial ERICA proposal, the experiments were distributed between WP1 to fill some of the knowledge gaps (biokinetics, biomarkers…) and WP2 to bring weight of evidence for a number of extrapolation issues. Various organisms were selected among the following categories: for a terrestrial ecosystem: plants, amphibians, soil invertebrates, soil microbial community; for aquatic ecosystems: phytoplankton, zooplankton, sediment microbial / meïofauna community. During the negotiation phase, the Consortium was asked to drastically reduce the experimental aspects. The only logical way to do that was to keep a tiny set of experiments with focused objectives: (1) to support by experiments the most relevant method(s) to extrapolate from individuals to populations and to compare external and internal exposure in terms of effects; (2) to deliver good laboratory guidance for that purpose. The selected species are invertebrates (one terrestrial, one aquatic involving therefore very different exposure media); one with sexual reproduction, another with asexual, the two strategies being of relevant importance with regards to the real biodiversity.

The reasons for selecting the two species will be fully described in the final protocol (to be discussed in June and produced as draft to be agreed on in September).

Regarding longer-lived organisms, one of the major constraints with experiments is animal husbandry. The first step is to establish a reliable life table for a well-defined, perfectly controlled reference population in the laboratory. This represents a significant work, but is of major importance to obtain good data on effects for exposed populations. The longer the life cycle, the longer is the period to achieve this first and necessary stage.

Other experimental set-up issues

General laboratory guidance will be prepared (draft in June) as well as the protocols (draft to be discussed during the September meeting).

Internal and external exposure. The criteria to select the radionuclide for internal exposure will be to control as far as possible the speciation in the exposure source and the uptake mechanisms (including

development in time), to detect the radionuclide accurately and at low-level with the "lightest" sample preparation and to allow precise dosimetric calculation at the microscale if needed. Classically, for external exposure, gamma irradiation will be used.

Choice of radionuclides. We need to control as far as possible the speciation, the biokinetic aspects and the dosimetric calculations, within a 12-month period of experiments. We also need to be able to purchase the radionuclide in the appropriate chemical form (which can be impossible for a number of exotics) and to respect radioprotection rules for those persons performing the experiments.

4.2.2 Plenary Discussion

NEALE KELLY: How is *Daphnia* relevant to a lot of other animals?

JG-L: It is a real challenge; it is a first step; we have to work on the extrapolation. See also additional explanations in the previous answers.

MARY CLARK: We understood the rationale. Worm is good, *Daphnia* not so good, so why not just do one properly? Why not make further steps based on what more people can feel comfortable with?

JGL: Not sure that any other choice will receive the standing ovation of the whole community. Moreover a lot of experimental constraints has to be taken into account (husbandry conditions, life cycle duration, necessary adequate rooms…and these constraints are species-specific. It is not so easy to shift from one species to another in a short-time scale!

CML: Daphnia question will haunt us, as ICRP excluded it from its choice. *Daphnia* is not so good, not so bad. It is a question of extrapolation theory, not the relevance of *Daphnia* as a species.

QUESTION TO EUG (CML): RBEs are not magic numbers. Within ERICA, how much weight would you put to RBE investigation?

- NAVA GARISTO: There are some existing reports, it is feasible (see SENES paper at the IRPA 11 conference – May 2004). It is not a major issue.
- JAN PENTREATH: It is not worth much effort here, there is so much other work going on.
- STEVE MIHOK: Time would be better spent on alpha in animals.

JILL SUTCLIFFE: Suggest that the ERICA Consortium creates an 'experiments wish list' so that other organisations are invited to do research, which would also benefit ERICA.

JGL: OK for this list. We suggest to provide it with justifications that will integrate the lessons learnt from ERICA recommendations on extrapolations issues (in other words this list of research priorities could be provided after D5).

5 WP3: Communication and Decision-Making – Irene Zinger

5.1 Presentation

The three main areas of WP3 were presented: i) stakeholder dialogue, including the End-Users Group (EUG) and development and application of communication methodology; ii) decision-making guidance; and iii) dissemination and training, including maintenance of the website. Main deliverables from WP3 are the transcripts of EUG meetings and briefing notes (D7a-h) and a report on Decision-Making Guidance (D8), all publicly available. The EUG meetings will be fora for the discussion on ERICA plans and deliverables, as well as a number of issues relevant to D8. An outline draft of this

deliverable will be available in September 2004. A total of seven EUG events will be held during the three-year project. The next will be the thematic meeting in September 13-14th 2004, Aix-en-Provence (i.e. after the ECORAD meeting).

A topic of discussion highlighted for the present meeting was consolidation of the EUG Terms of Reference (previously copied to all members, and part of the Technical Annex). To date, members have received two comments. First, a query about the name, End-Users Group, was highlighting that this did not really describe the group, which was a mixture of end-users, other expert advisors and stakeholders. Second, that ERICA required a commitment from members to attend three meetings, although it would only pay for two. During the previous day WP3 discussions, it was suggested that one might change the name to "External-Users Group", and that commitment could be satisfied by attendance at two meetings.

5.2 EUG Group Discussion feedback

GROUP1

- The worth of EUG needs to be demonstrated; what actions will be taken? What feedback mechanisms will be used, and how will transparency be guaranteed?
- Continuity is a problem when only two meetings are being paid for. Suggest a core-group.
- What kind of people/group do you want? Diversity of opinions or experts?
- ERICA vs other major activities e.g. ICRP: are there any interactions?

GROUP 2

- How will EUG affect changes in ERICA? How will products of EUG participation be documented?
- Need to identify within ERICA where EUG involvement is needed.
- Do EUG members have to pay for attendance at the third meeting?
- Emphasis on attendance at meetings overshadows alternate modes of communication (e.g. email, video-conferencing, discussion forum, chat rooms).
- Regarding the final demonstration workshop, WP3 members may see some people attending and then training others.

5.2.1 General response (IZ and DHO)

Transparency and feedback

Transcripts of all EUG meeting minutes and thematic discussions will be publicly available as deliverables. EUG meeting participants will be able to see and comment on a draft of these documents before final publication. The ERICA Consortium cannot guarantee to act on all EUG advice, but they will address and answer every query, comment and explain why they have, or have not, taken suggestions on board. WP3 will provide a generic outline of how EUG inputs are to be integrated into ERICA. Within the ERICA website, there will be an EUG members area and a public area set up and these should greatly enhance the exchange of information and documents.

EUG structure

The EUG is consolidated but not locked. There will be opportunity for additional members to join as necessary, but within the limitations of size, budget and those participants and experts we are "missing" (e.g. new member states, industry). ERICA welcomes suggestions from the EUG. There are links to other ongoing stakeholder consultancy actions within the ERICA EUG (e.g. ICRP and UNSCEAR), but we also wish to involve participants from outside the "old guard" of radiation protection.

Core Group

The possibility of a core-group was discussed during the planning of the ERICA project, but the disadvantages (e.g. elitist, exclusive, pre-selection of participants) were deemed to outweigh the advantages. The large group should help promote the diversity of opinions and expert knowledge (not everybody will have contributions to every issue relevant to ERICA work); continuity will be encouraged by some members being invited to attend additional meetings, and by participants making contributions to travel and subsistence expenses (many have already offered to make such contributions). A core group should be one that evolves naturally rather than one pre-selected by the ERICA consortium. To promote inclusion, any EUG member who wishes to attend meetings at their own expense (i.e. in addition to those paid for by ERICA) will be welcome, room permitting. Indeed, there were a number of such participants already at this meeting.

EUG Involvement

In the Technical Annex, the EUG meeting schedule identifies the ERICA EUGevents and draft ERICA WP deliverables that will be discussed at the various meetings. There will be opportunity for all EUG members to comment on deliverable drafts, whether or not they attend the meetings. All confirmed EUG members not attending this meeting were given the opportunity to comment on the proposed changes to terms of reference and the ERICA workplan.

Participation Methods

There are various participation methods planned within the EUG dialogue, including a web-consultation. It will not be necessary to attend all meetings to have an input.

5.2.2 Plenary Discussion

Terms of reference

There was a general consensus that the name End-Users Group was satisfactory (although during discussions various interesting alternatives were suggested: such as the Extraordinary Users Group, or the Extremely Useful Group!). The commitment to attend meetings was changed from three to two, although, following the suggestion of the EUG, alternative methods of participation will also be promoted.

NEALE KELLY: You still need to revisit your decision/structure, especially when it comes to the continuity and core-group.

DHO/IZ: Have still not heard any argument that overrules the extensive discussions that were held within the ERICA Consortium on the EUG structure (see above comments). But WP3 will revisit this question after the next EUG meeting, and after both sides (EUG and ERICA participants) have had time practical experience of what does and does not work.

6 Work Package 4: Case Studies – Brenda Howard (BJH)

6.1 Presentation

The Objective of WP4 is to apply and test, in case study scenarios for different contaminated sites, methodologies developed both under the EC FASSET Project and the integrated approach developed under ERICA. This will include: a) considering a variety of sites with different discharge histories and ecosystem types; b) that the selected sites have some readily available data (including effects observations in two cases); c) limited targeted measurements to reduce uncertainties; d) and identification of application problems, testing and validating underlying data and assumptions. An overview of the case studies was shown and is available in the Technical Annex. The case study sites cover the different FASSET ecosystems with both natural and artificial radionuclides being considered. The work package has two deliverables: D9 – Results of the application of the FASSET framework to case study sites with recommendations for improvement; and D10 – Results of the application of the ERICA integrated approach to case study sites with recommendations for finalisation. A description was given for each site and the key issues to be addressed were as follows.

- Does FASSET methodology work?
- Is the required information available in FASSET?
- Do we have adequate information for the case study?
- Is the outcome "reasonable"?
    - concentration in biota
    - external dose
    - effects)
- What is the overall confidence in the assessment?

6.1.1 Questions of clarification (answered by BJH)

- Are there control sites for the observed effects at the case study sites? WE WILL HAVE TO EVALUATE CAREFULLY WHETHER THIS IS RELEVANT. HOWEVER THE AIMS IS TO USE THE AVAILABLE OBSERVATIONS AT THE SITES (THESE COVER A RANGE OF DOSES) AND COMPARE THIS AGAINST EXPECTED EFFECTS (I.E. FROM FASSET DELIVERABLE WOODHEAD AND SINGER)
- Links to WP3? WE WILL START EARLIER THAN PLANNED.
- What about socio-economical aspects, sustainable development etc? BEYOND ERICA.
- Eminently sensible. But what are the success criteria? FOR FIRST PHASE, THE CRITERION IS: IS THE FASSET FRAMEWORK OUTPUT PRACTICALLY USEFUL AND WORKABLE?

6.2 EUG discussion feedback

GROUP 1

- You need control sites. Interpretation should be more scientific, e.g., derived from hypotheses and experiments.

- How is dosimetry being validated?
- The success criteria seem too generic, what are they?
- Five sites is too much.

GROUP 2

- Is there sufficient time for the products of WP4 to affect change in ERICA?
- Are the "data quality objectives" being observed in the design of WP4 test of FASSET (e.g. upfront decision-making, ecological effect monitoring, number of samples, statistical power, US/Canadian model)?
- What are the criteria for success in evaluating FASSET?
- Need to clearly define the questions for application of FASSET (what are you trying to achieve?).
- The identification of reference/control sites needs to be incorporated into the tests.
- Are you testing sites that form the basis for the FASSET database (e.g. Chernobyl, circular arguments)?

6.2.1 General Response (BJH)

Management and time efficiency

It will be important to have the deliverable in time. Timing is critical (note that in the original proposal allocated 42 months for this activity).

Number of case studies

We do expect to revisit the decision of selecting five case studies, but that will be taken after the 1st year, and when the first phase is over. A new discussion will be taken at Month 13.

Evaluation criteria

The first phase is intended to be a test/validation (where possible) of FASSET, as opposed to a new technical/mechanical methodology. We are well aware of circular arguments, and will ensure that data are not "double accounted". Novel data not considered in FASSET exist for the Chernobyl site.

6.2.2 Plenary Discussion

NAVA GARISTO: The value of WP4 will be increased if you do more than evaluate methodology, particularly a stronger focus on problem formulation.

STEVE JONES: Remember that these are not experiments but case-studies.

7 Summary

The EUG provided a comprehensive evaluation of the workplans for the four ERICA Work Packages (WPs), submitting many useful comments and suggestions. Many of the inputs related to clarifications of the plans, largely to ensure that the ERICA project defines clearly its intentions and choices. While the FASSET Framework and the ERICA Technical Annex form an explicit basis for the work to be done under ERICA – and thereby set the boundaries to the proposed activities - it is clear that the choices made by the Consortium should be as transparent as possible. This means that ERICA needs

to define the choices made and describe the rationale behind each decision, state clearly the assumptions and uncertainties in all parts of the project and above all do its best to be accountable to the EUG. Some of the main points made by the EUG, and the proposed action by the ERICA Consortium have been summarised in the following Table.

	EUG COMMENTS	ACTION FOR ERICA
WP1	Set boundary of assessment tool (e.g. work mainly from equilibrium state). Code development needs to be clearly stated	Contact EUG for inputs on tool development – via WP3.
WP2	Define clearly the selected choices, supported by rationales for the choices.	Clearly define the reasoning for selection of experimental organisms in deliverable. Provide EUG with list of experiments, which would help ERICA
WP3	Update EUG list regularly. Keep EUG informed of ERICA developments.	Provide outline on how EUG inputs will be taken into consideration within ERICA. Revisit EUG structure after the next EUG meeting.
WP4	Define clearly the purpose of the testing of the FASSET and ERICA methodologies on the case-studies. Timing is critical to WP4 success, and based on good interaction with the other WPs.	Revisit number of case studies at Month 13.
EUG	EUG inputs/responses/continuity lie with EUG members. EUG are welcomed to more than two meetings, at their own expenses in principle.	Propose potential EUG candidates to WP3

Next Meeting	**Location**	**Date**
EUG Thematic meeting	Aix-en-Provence, France	13-14/09/04