

# ISAM NEWSLETTER



Number 3

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**ISAM : THE INTERNATIONAL ATOMIC ENERGY AGENCY**

**PROGRAMME ON IMPROVEMENT OF SAFETY ASSESSMENT**

**METHODOLOGIES FOR NEAR SURFACE WASTE DISPOSAL FACILITIES**

Edited by: Carlos TORRES. WASTE SAFETY SECTION, DIVISION OF RADIATION & WASTE SAFETY, INTERNATIONAL ATOMIC ENERGY AGENCY

WAGRAMERSTRASSE 5, P.O. BOX 100, A-1400 VIENNA (AUSTRIA) Telephone: +43 1 260021428 Facsimile: +43 1 2600721428 E-mail: C.Torres@iaea.org

The International Atomic Energy Agency (IAEA) launched a new Co-ordinated Research Programme in November 1997 on Improvement of Safety Assessment Methodologies for Near Surface Radioactive Waste Disposal Facilities (ISAM). The first Research Co-ordinating Meeting was held in Vienna in November 1997. The aim of the programme is to review and enhance

post-closure safety assessment approaches and tools for near surface disposal facilities as well as providing participants with practical safety assessment experience. There are three Working Groups (Scenario Generation and Justification, Modelling and Data, and Confidence Building) plus Group Safety Cases.

Since November 97 some important ISAM activities has been carried out. The second newsletter was issued and the first ISAM Working Groups Meeting was held in Rio de Janeiro, Brazil during July 1998. It was hosted by the Brazilian Nuclear Energy Commission (CNEN) of Brazil. Its aim was to progress the activities of each Working Group and the Group Safety Cases through the review and development of existing documents. As a result of the meeting the Group Safety Cases were refocused on the nature of the disposal facility rather than in the purpose of the assessment. The following three types of facilities were agreed: a Radon type facility, a borehole type facility and a vault type facility based on current engineering designs.



The Vault Type Facility Safety Case was launched in November 98 at Risley, UK

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Please note in your diaries: ISAM 1999 Plenary Meeting will be held in the week 1-5 February, at the IAEA in Vienna.

The Vault Safety Case Group was launched in November 98 at Risley, UK. The meeting was hosted by BNFL. Ten experts on safety assessment from France, Spain, Czech Republic, Sweden and UK attended the meeting with the goal of applying the ISAM FEP (Features, Events and Processes) List to the vault type facility. The meeting was conducted by Eugene Kelly from BNFL.

If you would like more information about the ISAM programme please contact either:



**Ms. Annette Pinner (ISAM Chairperson)**

Research and Technology  
British Nuclear Fuels Ltd.  
Rutherford House  
Risley  
Warrington  
WA56AS  
United Kingdom

Phone: +44 1925 832425

Fax: +44 1925 832016

E-mail: [a-pinner@consultancy-services.com](mailto:a-pinner@consultancy-services.com)

or



**Mr. C. Torres (ISAM Scientific Secretary)**

Waste Safety Section  
Division of Radiation and Waste Safety  
Department of Nuclear Safety  
International Atomic Energy Agency (IAEA)  
Wagramer strasse 5, P.O. Box 100

A-1400 Vienna

Austria

Phone: +43 1 260021428

Fax: +43 1 26007

E-mail: [C.Torres@iaea.org](mailto:C.Torres@iaea.org)

## 1. ISAM CO-ORDINATING GROUP MEETINGS

There has been several ISAM Co-ordinating Group Meetings since the last newsletter in March 1998. The Co-ordinating Group met in Rio de Janeiro on July 1998, during the first ISAM Working Groups meeting and on November 1998 in Resley, UK.



**ISAM Co-ordinating Group**

*ISAM Co-ordinating Group Meetings (Rio de Janeiro, Brazil, July 1998)*

Meetings were held on 25 July 1998 to finalise plans for the Working Groups Meeting and on 27 July 1998 to review progress up to that point. A third meeting was held on 31 July 1998 after the Working Groups Meeting had been closed. It was decided that the Working Groups Meeting would initially be documented as a two sided 'executive summary' (which has now been produced and distributed to all on the ISAM mailing list).

*ISAM Co-ordinating Group Meeting, (Risley, UK November 1998)*

This meeting was run in parallel with the first Vault Safety Case Group meeting. The main objectives of the meeting were to review progress since the July 1998 Working Groups Meeting, agree on a provisional work plan for the remainder of the ISAM programme and organise the next Research Co-ordinating Meeting in February 1999. Major milestones in the provisional work

plan are shown in Table 1.

ISAM Research Coordinating Meetings	February 1999, February 2000, June 2001
Coordinating Group meetings	November 1999, November 2000, February 2001, November 2001

**Table 1**

Note that it is also planned that the Working Groups and Safety Case Groups will meet between each of the Research Co-ordinating Meeting.

It was suggested that the following outputs should be produced by the end of the ISAM programme in November 2001.

1. A technical document which:
  - records each Working Group's evaluation of available approaches and tools and how they have been enhanced during the ISAM programme;
  - documents the lessons learnt during the implementation of these tools and approaches by the Safety Case Groups;
  - is independently peer reviewed prior to publication.
2. An 'executive summary' of the technical document.
3. Information which will be placed on the Virtual Workspace, including:
  - collated information on available computer codes and input parameters;
  - questionnaires and resulting summary reports;
  - electronic copies of the executive summary and technical document as well as other supporting documents and references.

Participants' comments on these deliverables and the work plan will be sought at the next Research Co-ordinating Meeting.

## **2. WORKING GROUP AND SAFETY CASE ACTIVITIES.**

### **Scenario Generation and Justification Working Group**

#### *Introduction*

The Scenario Generation and Justification Working Group (Scenarios Working Group) identified four areas of interest to the ISAM programme:

- definition of terms
- production of a FEPs database;
- production of a generic set of scenarios; and
- evaluating of methods for generating and screening FEPs and scenarios.

During April 1998, a draft of the Scenarios Working Group discussion document "Development of an Information System for the Safety Assessment of Near Surface Radioactive Waste Disposal Facilities", was distributed to ISAM members for comments and was uploaded to the ISAM Virtual Workspace. This led to an update in June 1998 and a second update in November 1998, after input and comments from the Working Group Meeting in Rio de Janeiro, July 1998. The discussion document focused mainly on the first three above-mentioned activities, although a summary is provided on the status of scenario generation activities in the international community. Of particular importance are the FEPs database and the set of generic scenarios.

#### *The ISAM International FEPs List*

The ISAM FEPs database currently consists of 141 International FEPs (IFEP) adopted from the Nuclear Energy Agency (NEA) FEPs database for geological disposal systems. Each IFEP entry consists of three elements: (1) a definition, which defines the scope of the IFEP, (2) an optional comment, which give more specific remarks, and (3) specific examples of FEPs related to the IFEP.

The structure of the NEA database was retained, although the ISAM effort will be directed towards making it applicable to as wide range of near surface disposal facilities as possible, and to expand the list with examples related to each IFEP. If required, additional IFEPs applicable to near surface disposal facilities will be added to the list.

#### *Generic Scenarios*

Apart from formal tools and approaches that can be used to generate and justify a complete set of

scenarios in safety cases, participants at the first Research Co-ordinating Meeting indicated that they are also interested in a set of generic scenarios used in the safety analysis of near surface disposal systems. For those who prefer, the set of generic scenarios can be used as a guideline of what scenario to consider for different settings and facility types. The information from 17 organisations compiled so far includes: owner of the scenario (organisation), facility type (e.g. near surface coastal – vault), scenario type (e.g. normal evolution), events included and excluded for the specific scenario, status of the assessment, and a reference. Note, however, that this information is treated confidentially and no reference to specific sites or facilities is made in the document.

*Working Groups Meeting (Rio de Janeiro, July 1998)*

About 20 people attended the Scenarios Working Group activities. The main focus of the Scenarios Working Group during the meeting was to review the Scenarios Working Group discussion document. Although no serious changes were necessary to the structure of the document, several issues were raised that should be addressed. In general, the feeling of the Scenarios Working Group was that the document is in line with the objectives set for the Scenarios Working Group during the first Research Co-ordinating Meeting.

The main discussion point at the meeting was the issue of the comprehensiveness of the IFEPs list. This is mainly because the list was derived from the NEA FEPs list which focused on geological disposal systems. The concern was that FEPs were included in the list, which are not relevant to near surface disposal systems. After a lengthy discussion it was the consensus of the meeting that FEPs should not be eliminated, but some methods could be used to identify the FEPs applicable to near surface disposal facilities.

Specific activities were identified during the meeting that will contribute to the objectives of the Scenarios Working Group. This includes the following:

- Using the waste classification scheme to identify FEPs relevant to different compliance periods and for generic types of repositories.

- Extending the amount of information included in the tables on generic scenarios.

*ISAM Co-ordinating Group Meeting (Risley, November 1998)*

During the meeting an important decision was made in terms of the goals for the Scenarios Working Group. It has been proposed that the focus of the Scenarios Working Group should not be to produce an electronic, relational database version similar to the NEA database for geological disposal. The advantage of this approach is that the working group can focus more on the development and description of the FEPs list, as well as methods to generate scenarios.

*ISAM Research Co-ordinating Meeting (Vienna, February 1999)*

The focus of the upcoming Research Co-ordinating Meeting will be to report on specific activities of the Scenarios Working Group during the past year and to organise Scenarios Working Group activities for the remainder of the programme. Of particular importance is the ISAM FEPs list, the generic scenarios, and as a new activity, methods used to generate and justify scenarios for safety assessment analysis.

The revision of the ISAM FEPs list (i.e. the definition, comment and example FEPs) will remain an important activity of the Working Group for the year to come. Comments made to date will be discussed, and Scenarios Working Group members will be organised in smaller groups to be responsible for editing and reviewing specific groups of FEPs.

The progress made with the compilation of generic scenario information will be presented to the Working Group.

According to the objectives and actions set for the Scenarios Working Group at the November 1997 Research Co-ordinating Meeting, another activity for 1999 is the accumulation of information on approaches used to generate and justify scenarios. Several sources have been identified and progress made will be reported.

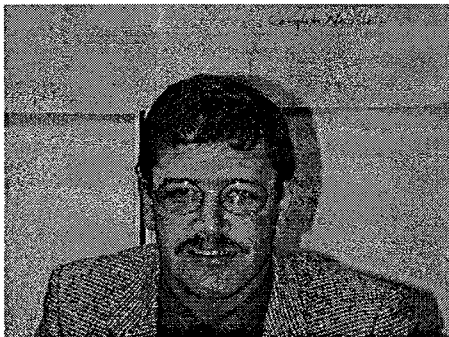
The report of the group safety cases (e.g. the Vault Safety Case) will provide valuable input to the Scenarios Working Group in terms of the FEP lists that they developed and approaches used to

generate scenarios. This information will be reviewed and incorporated into the Scenarios Working Group activities.

Methods and approaches for use of the Virtual Workspace to review the Scenarios Working Group document will be discussed. This will include the use of the document review form developed by the Confidence Building Working Group.

By the end of the meeting a table of contents for the Scenarios Working Group contribution to the ISAM technical document should be finalised.

If you are interested in participating actively in this Working Group please contact the IAEA Scientific Secretary or the Working Group Leader.



**J. van Blerk**

Atomic Energy Corporation of South Africa  
Limited  
P.O. Box 582  
0001 Pretoria  
South Africa  
Tel: +27 (12) 316-5432  
Fax: +27 (12) 316-5138  
E-mail: [jjvblerk@aec.co.za](mailto:jjvblerk@aec.co.za)

## **Modelling and Data Working Group**

### *Introduction*

During the first Research Co-ordinating Meeting held in Vienna on November 1997, the participants presented 17 ideas on which the ISAM working group on modelling and data should focus. At that time, an effort was made by the participants to identify related ideas that could be treated in a common way. In addition the main topics that ISAM should be address were identified, resulting in four areas for further discussions, as shown below.

- A manual incorporating major conceptual models with examples, including discussions about boundary conditions (applications and limitations). A manual was also recommended about approaches linking scenario development, to conceptual models, to mathematical models and finally to computer codes.
- A list should be developed of the main parameters used in safety assessments including definitions. It was envisaged that this database would be particularly helpful during the site selection phase or during early interactions of the safety assessment process when little site specific information may be available.
- A parameter glossary should be developed.
- A list should be developed containing the main codes used in safety assessment.

Also, some key people were identified to take responsibility for each of the tasks.

### *Working Groups Meeting (Rio de Janeiro, July 1998)*

Discussions were held about the ideal structure of the working group document on modelling and data. Also some new key people for the improvement of document information were identified. A brief technical revision of the document was also made at that time and some good suggestions will be incorporated in the document, for example: a description of models for flow and transport in fractured systems and a list of the main relevant references related to safety assessments.

The main contents of this document can be seen below:

Chapter I contains a brief description of a near surface disposal facility and a presentation of the main concepts and features that are considered when performing a safety assessment. The aim of this item is to establish a common conceptual framework to be shared throughout the publication.

Chapter II describes how the outcomes of the scenario generation analysis are taken into consideration in the development of mathematical models.

Chapter III contains a brief description of some mathematical models and concepts commonly utilised when performing safety assessments. It also includes some screening models.

Chapter IV contains a list of some computer codes used in safety assessment. Participants of the ISAM programme expressed considerable interest in collecting information about them. This can be very important for those countries which are developing their own codes.

Chapter V contains a list of the main parameters involved in the safety assessment, including definitions.

Chapter VI will contain a list of the main parameters values found in literature. It is envisaged that this simple "database" would be particularly helpful during the site selection phase or during early iterations of the safety assessment process when little site specific information may be available.

At the end of the document two annexes were included. Annex 1 contains information about mathematical tools, differential equations and solutions for those commonly used in safety assessment and Annex 2 contains a list of the main relevant references related to safety assessment.

At the meeting discussions showed the need for standardising the units of the document and this action will be completed in the near future.

During the brief revision of the first draft of the document, a lot of comments were made by all participants and these will be taken into consideration, in the next few months. The goal is to have a copy available for the participants at the next Research Co-ordinating Meeting.

It was also decided to assign responsibility for the different chapters to different individuals to help with information selection.

Although some improvements on the document contents were made from the first Research Co-ordinating Meeting (November 1997), a lot of work still remains to be done. For example: description of some screening models for the biosphere (including intrusion scenarios), models

for corrosion rates, solubility models, thermodynamics models, empirical models, methodologies to go from scenarios to models, analytical solutions used in safety assessment, parameter tables, etc.

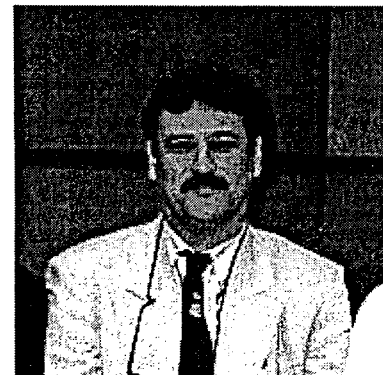
Participants are requested to send contributions to the document to Mr. Heilbron, as soon as possible.

*ISAM Research Co-ordinating Meeting (Vienna, February 1999)*

A brief presentation showing the progress made by the modelling and data working group will be made at the next Research Co-ordinating Meeting

The Co-ordinating group plans to have a third draft of the Modelling and Data Working Group document ready to be distributed at the third Research Co-ordinating Meeting meeting, to be held in February 2000, allowing the participants to present their last comments on the document. Major changes on the documents should be made until the third Research Co-ordinating Meeting. We intend to submit the document for peer review not later than February 2001, to have the final version ready to be distributed at the last Research Co-ordinating Meeting (June 2001).

If you are interested in participating actively in this Working Group please contact the IAEA Scientific Secretary or the Working Group Leader.



**Mr. P. Heilbron**

Comissao Nacional de Energia Nuclear (CNEN)  
Rua General Severiano No. 90  
CEP 22.294-900  
Botafogo  
22294-900 Rio de Janeiro - RJ  
Brazil  
Tel: +55 (21) 546-2466/546-2374  
Fax: +55 (21) 546-2383  
E-mail: paulo@cnen.gov.br

## Working Group On Confidence Building

### *Introduction*

A year has passed since the ISAM project began, and the following is a brief review of the activities of the Confidence Building Working Group during this first year.

Following the November 1997 Research Co-ordinating Meeting, the Confidence Building Working group began by initiating activities in two of the four areas that were the focus of discussion during the November meeting. At that meeting, activity areas had been established under the four topics:

- Quality Assurance (safety assessment related topics)
- Compilations (assembly of information i.e., national safety case documentation, regulatory documents)
- Uncertainty and sensitivity analysis (discussion and the ISAM safety assessment process)
- Communications (communication on radioactive waste issues with different audiences)

From the meeting, the initial task was to develop a list of questions that would provide the Working Group with information on national safety cases and regulations concerning radioactive waste disposal from the various jurisdictions represented (compilations). Similarly, a questionnaire was assembled for the area of quality assurance in order to determine the status and use of QA programs within the different safety assessment groups. Both these questionnaires were developed in the months following the first meeting. The questionnaires were distributed and responses were received, reviewed and two reports were prepared.

### *Working Groups Meeting (Rio de Janeiro, July 1998)*

The questionnaires described above and the resulting reports were presented at the first meeting of the Working Groups held in July. Summaries of these activities, including the reports and initial questionnaires, can be found on the ISAM virtual workspace under the Confidence Building Working Group. At the July meeting, in addition to continuing the efforts to further the

compilations and quality assurance sub-groups, the communications, uncertainty and sensitivity analysis sub-groups were launched.

Perhaps most importantly, the list of individual tasks (which numbered over 40 at the first meeting) was revisited to reaffirm the original tasks and priorities and secondly to focus on a subset of activities that would be achievable during the ISAM project time frame. This was a successful exercise, in that there was consensus on the items that were determined to be of high priority. Debate on some of the lower priority items did take place, but when the project time frame was brought into consideration it was clear that only the top priority items could be delivered.

For example, it was decided that one of the most beneficial activities related to quality assurance would be to introduce some very specific and practical examples of how QA activities can be incorporated into safety assessment. In this case, an audit trail (paper trail) was the first area to be considered with the issue of document review form, and how a record of comments and resolutions to comments could be recorded. The Confidence Building Working Group designed a template which fits the requirements that the group identified (record of comment, resolution, evidence of agreement on resolution etc.). The form can be found on the ISAM Virtual Workspace.

Work in the area of uncertainty and sensitivity analysis was started in the form of the preparation of a technical paper discussing the application of uncertainty analysis and sensitivity analysis within the ISAM safety assessment process. The abstract for this paper can be found on the ISAM Virtual Workspace.

### *ISAM Research Co-ordinating Meeting (Vienna, February 1999)*

At the upcoming ISAM Research Co-ordinating Meeting work will continue in the four topic areas of the Confidence Building Working Group. The following paragraphs set the goals for this next meeting.

- Communications  
In the area of communications the results from the recent questionnaire will be presented.

Because of the interest in the topic of public participation at the July meeting, a topical session is planned for this area at the February Research Co-ordinating Meeting. This topical session will be summarized and become part of the communications document.

- **Quality Assurance**  
Continuing the work on the QA audit trail, the procedure and example on the use of the document review form will be presented and revised, as appropriate. A parameter input control form will be developed at the February meeting. A procedure and guideline for use of the form will be a task to be completed following that meeting.
- **Uncertainty and Sensitivity Analysis**  
Starting with the uncertainty and sensitivity analysis paper, the ISAM safety assessment process flowchart will be examined with the purpose of providing some guidance on when and how sensitivity analysis and uncertainty analysis would be most beneficial. As well, the contributions required for extending the existing document to a position paper will be discussed and individuals who will contribute will be identified.
- **Compilations**  
The safety assessment documentation which has been collected will be reviewed for 'patterning' (identification of common and also unique elements) and the observations from this effort will be incorporated into the document on safety cases. Through the participation of the Confidence Building Working Group members, a 'patterning' of disposal regulations will also be conducted and documented.

In addition to completing the items described above and the assignment of new tasks, the Confidence Building Working Group will also prepare a table of contents for the summary document. The use of the audit trail forms will be presented to the groups performing safety cases so that they can be assessed within the ISAM program. The task of documenting the experience of using these forms will also be assigned.

If you are interested in participating actively in

this Working Group please contact the IAEA Scientific Secretary or the Working Group Leader.



**Mr. G. Dolinar**

Atomic Energy of Canada Limited  
(AECL)

Chalk River Laboratory  
Chalk River KOJ 1JO Ontario  
Canada

Tel: +1 (613) 584-8811 x4311

Fax: +1 (613) 584-1850

E-mail: dolinarg@aecl.ca

## SAFETY CASES

### *Group Safety Cases*

During the Working Group meeting held in Rio in July 1999, it was decided to adjust the focus of the Group Safety Cases. Prior to the meeting, draft Group Safety Case descriptions were prepared along the lines recommended by ISAM participants at the first Research Co-ordinating Meeting. That is, the safety cases were focused on the purpose of the analysis: a "past practices" case, a "proposed facility" case and a "siting" case. During the Working Groups meeting, it became apparent that this division of effort was not resulting in an appropriate mix of participants in the groups.

As a result, the Group Safety Cases were reconfigured to reflect the type of facility rather than the purpose of the analysis. The revised Group Safety Case represent (1) a RADON-type disposal facility, (2) a vault disposal facility similar to those found in Western Europe and North America, and (3) a borehole disposal facility.

Subsequently, work was done to modify the safety case descriptions to more accurately reflect the needs and desires of people showing interest in the



Group Safety Cases. In addition, individuals have been identified that will co-ordinate further development of each Safety Case, and who will co-ordinate safety case activities at future ISAM meetings.

Considerable effort has been put into the Group Safety Cases since the Rio Working Groups meeting. The safety case descriptions have been revised and improved, and progress has been made toward applying the ISAM FEPs list to one of the three cases.

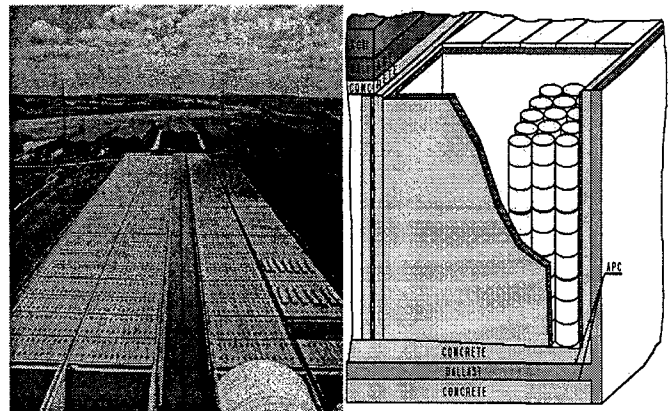
**Vault Safety Case:** Safety Case Leader – Eugene Kelly.

<b>VAULT TYPE FACILITY: ASSESSMENT CONTEXT</b>	
<b>PURPOSE:</b>	<ul style="list-style-type: none"> <li>• Evaluation of planned disposal facility</li> <li>• Derive waste acceptance criteria for the facility</li> </ul>
<b>ENDPOINTS:</b>	To be determined.
<b>ASSESSMENT PHILOSOPHY:</b>	To be determined.
<b>REPOSITORY TYPE:</b>	Disposal vaults of the type that are prevalent in Western Europe and North America.
<b>SITE CONTEXT:</b>	Vaalputs, Republic of South Africa.
<b>INVENTORY:</b>	Based on published information for a North American disposal facility.
<b>TIME FRAME:</b>	No conclusion about duration of analysis. Institutional control: range between 100-300 years.
<b>SOCIETAL ASSUMPTIONS:</b>	Present day agricultural practices as in Namaqualand, South Africa with variations to incorporate indigenous people lifestyles.

*Past Activities:*

The Vault Safety Case Group met from 17 – 19th November at BNFL, Risley. The aim of the meeting was to apply the ISAM FEP list to the vault safety case and identify an approach that could be used to develop scenarios. The Group started by reviewing the existing assessment context and system description documentation relating to the vault safety case and identifying associated clarifications and modifications. The Group then screened the ISAM FEP list, identifying and justifying the FEPs that could be excluded for the purpose of the vault safety case on the basis of the case's assessment context and system description. Possible approaches to developed scenarios were then discussed and an agreed approach was applied. The approach

involved the development of a “design scenario” (how the disposal system is planned to evolve) from which “altered scenarios” can be subsequently developed. In order to assist in the development of the design scenario, it was found useful to identify safety related features and their safety function, and to identify states for the external FEPs. An outline description of the design scenario was developed using this approach. Actions and the associated timetable arising from the meeting are summarised below.



**Vault Type Facility**

It was agreed that the following safety case specific issues will be discussed by the Group at its meetings during the February RCM:

- the review and application of approaches that can be used for the identification of FEP interactions;
- the development of conceptual models;
- the development of mathematical models and identification of associated data;
- the agreement of the safety case report's structure; and
- the identification of participants willing to undertake calculations.

During the development of the vault safety case at the meeting, a number of points of interest to the wider ISAM programme were noted. These are summarised below.

- It is considered that the current relatively high level ISAM FEP list is at appropriate level of detail to allow it to be used as a checklist at various stages of the assessment process, although certain minor changes are required to checklist.
- It was found that the assessment context and system description are valuable inputs to the

initial screening of FEPs.

- It is considered that the development and assessment of a design scenario can be used to help guide the subsequent development of alternative scenarios.
- It was found helpful to postpone the consideration of detailed FEPs until after the development of the design scenario description.

*Leading up to the Research Co-ordinating Meeting in February 1999:* Additional effort will be directed toward scenario analysis and conceptual model development for the safety case. These efforts will be co-ordinated by Eugene Kelly.

*At the Research Co-ordinating Meeting in February 1999:* The Vault Safety Case has been the most successful of the three Cases in making progress. Consequently, results from this safety case will be presented at the meeting as an example for the other safety cases to follow.

*Following the Research Co-ordinating Meeting in February 1999:* A Safety Case meeting will be held sometime during 1999, to make further progress on the safety case. A date and location for the meeting has not yet been established.



**E. Kelly**  
British Nuclear Fuels Ltd.  
Rutherford House  
Risley  
Warrington  
WA56AS  
United Kingdom  
E-mail: ejk2@bnfl.com

## Radon-Type Facility Safety Case:

acting Safety Case Leader - Zlatan Delalic.

*Past Activities:* The RADON Type facility Safety case has been set up to offer to ISAM participants from Eastern and Central European countries the possibility of exercising the safety assessment methodology. This Safety Case represents an integration of the ISAM participants and an ongoing project from the Swedish Radiation Protection Institute (SSI), on safety of radon type facilities in Russia.

Participants from Russia, Lithuania, Bulgaria, Hungary and Check Republic participated in the working session held in Rio July 98.

A preliminary assessment context for the Safety case was prepared during the meeting. The facility description for Novi-Han was reviewed.

### **SAFETY CASE RADON TYPE FACILITY: ASSESSMENT CONTEXT**

**PURPOSE:**

Demonstrate compliance with regulatory requirements  
Waste acceptance criteria for disposal (Activity limits)  
Guide research priorities  
Contribute to confidence of policy makers and Scientific Community

**ENDPOINTS:**

The end-points will be derived from "International Regulations"

**ASSESSMENT PHILOSOPHY:**

It will depend on the knowledge of the disposal system and the availability of data. The objective is to develop a best estimate/realistic case.

**REPOSITORY TYPE:**

Eastern/Central European disposal facility (RADON Type facility)

**SITE CONTEXT:**

Volga river region

**INVENTORY:**

A combination of Bulgaria (Novi-Han)/Hungary and Russian inventories.

**TIME FRAME:**

10,000 yr. (A Reference Biosphere concept could be applied)

Institutional control: range between 30-300 yr.

**SOCIETAL ASSUMPTIONS:**

Present day agricultural practices as in Eastern and central European countries. Exclude commercial and industrial activities. The repository is located close to urban areas. Ground and surface water used for irrigation, animal watering and for all domestic uses.

A meeting to review and complete the concept description, the assessment context and to apply the ISAM FEP's list to the RADON concept is being organised by GOZATOMNADZOR and SSI in Moscow. Representatives from Russia, Baltic and Eastern and Central European countries are

expected to participate in the meeting. The work schedule is as follows.

- Complete the assessment context (end points, site context, inventory, societal assumptions).
- Complete the facility description. The new version will include the Volga river region geology and biosphere and information about waste treatment in the facility, waste packages and the facility.
- Hold a meeting to apply the ISAM FEP list to a RADON facility.

*Leading up to the Research Co-ordinating Meeting in February 1999:* Delays in the RADON-type Facility Safety Case have resulted in its being slightly behind the other two. It is expected that a revised safety case description will be published prior to the Research Co-ordinating Meeting. In addition, it is expected that some FEP analyses for national facilities will be completed and ready for review at the meeting.



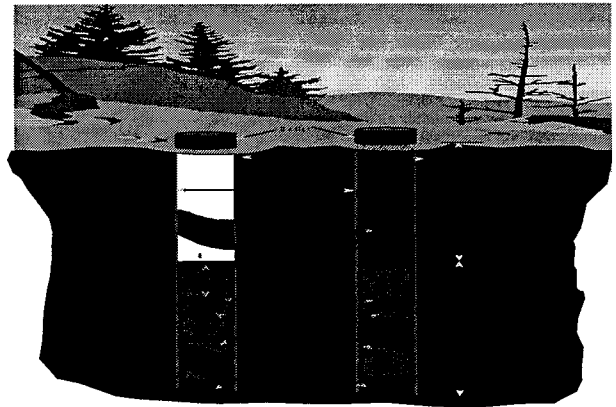
**RADON Type Facility**

*At the Research Co-ordinating Meeting in February 1999:*

The assessment context will be finalised and the ISAM FEPs list will be applied. The plan of work following the meeting will be defined. The leader for this activity will also be agreed.

**Borehole Safety Case:** acting Safety Case Leader - Koos Vivier .

*Past Activities:* The Borehole Safety Case has chosen to alter the context away from siting toward demonstrating "proof of concept". The assessment will be conducted for the Vaalputs site, with sensitivity analyses to test the concept for less favourable geological settings.



**Borehole Type Facility**

*Leading up to the Research Co-ordinating Meeting in February 1999:* Work has begun on the Borehole Disposal Safety Case. The draft FEP list is being applied to the safety case, and an initial set of scenarios will be developed from them. These results will be made available for review prior to the February Research Co-ordinating Meeting. In addition, it is likely that some consequence analysis results will be available prior to the Research Co-ordinating Meeting.

**BOREHOLE TYPE FACILITY: ASSESSMENT CONTEXT**

**PURPOSE:**

- Proof of principle for disposal concept
- Derive waste acceptance criteria for the approach

**ENDPOINTS:**

Effective dose limit of 1 mSv/yr will be applied without additional constraints.

**ASSESSMENT PHILOSOPHY:**

A conservative analysis will be applied to evaluate the likely acceptability under alternative geological conditions.

**REPOSITORY TYPE:**

Borehole disposal of spent sources, as described by van Blerk (1997)

**SITE CONTEXT:**

Vaalputs, Republic of South Africa, with geological sensitivities investigated.

**INVENTORY:**

Inventories based on national spent source inventories from African nations.

**TIME FRAME:**

Assessment will be carried out until the peak dose is observed. Institutional control: range between 30-100 yr.

**SOCIETAL ASSUMPTIONS:**

Present day agricultural practices as in Namaqualand, South Africa.

*At the Research Co-ordinating Meeting in February 1999:* The focus of work at the Research Co-ordinating Meeting will be to review the efforts to date, to critically comment on the FEP analysis and other technical approaches generated prior to the meeting.

*Following the Research Co-ordinating Meeting in February 1999:* Revisions will be made to the technical analysis based on comments received at the meeting, and additional analyses will be planned. It is expected that there may be scope for a Safety Case meeting in 1999. A decision about such a meeting will be made based on the results of the Research Co-ordinating Meeting.

For more information, please contact the IAEA scientific secretary or the Safety Cases Leader.



Mr. M. Kozak  
QuantiSci, Inc.

3900 South Wadsworth Boulevard, Suite 555  
80235 Denver, Colorado  
USA  
Tel: +1 (303) 985-0005  
Fax: +1 (303) 980-5900  
E-mail: m\_kozak@quantisci.com

### 3. FORTHCOMING EVENTS

The next ISAM event will be the Second Research Co-ordinating Meeting which will be held at the IAEA in Vienna from 1-5 February 1999. During this meeting participants will initially be able to gain an overview of progress within the ISAM programme as a whole and then to progress the Group Safety Cases and tasks within the Working Groups. Plans for each group will be agreed through to the end of the ISAM programme in November 2001. Participants will have the opportunity to seek comments on their individual safety case through a poster session. There will also be the chance to learn how to use the ISAM Virtual Workspace for those participants who are not already familiar with it.

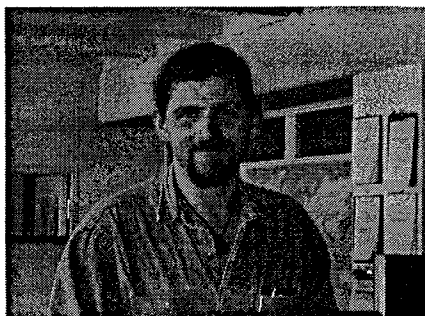
### Provisional agenda for the Second Research Co-ordination Meeting 1-5 February 1999, IAEA, Vienna

	Morning	Afternoon
<b>Monday 1 Feb</b>	Plenary session:	Safety Case Groups: parallel sessions
<b>Tuesday 2 Feb</b>	Working Groups: parallel sessions ISAM Virtual Workspace Workshop	Safety Case Groups: parallel sessions
<b>Wednesday 3 Feb</b>	Working Groups: parallel sessions ISAM Virtual Workspace Workshop	Topical session: public acceptance and Safety Assessment Individual safety cases: poster session
<b>Thursday 4 Feb</b>	Safety Case Groups: parallel sessions	Working Groups: parallel sessions ISAM Virtual Workspace Workshop
<b>Friday 5 Feb</b>	Plenary session	Co-ordinating group meeting

#### 4. ISAM Virtual Workspace

The ISAM Virtual Workspace provides the opportunity through the World Wide Web for ISAM participants to share information and to work together on the Safety Cases and Working Group activities. The workspace has been in operation for approximately one year, and at the Working Groups meeting in July 1988, training sessions were conducted for groups of participants who had not previously used the system. The sessions, run by G. Hinterleitner (IAEA) were highly successful and a similar opportunity will be provided at the upcoming Research Co-ordinating Meeting. The ISAM Virtual Workspace contains documents generated by the project along with other reference documents and materials.

The workspace is a prototype that is being evaluated through the ISAM project, and at the July working groups meeting several issues were identified that would improve it. Because of the amount of information now contained on the workspace, there was a need to develop a structure that would allow users to know where to find the different types of information. For those participants who have not yet used the ISAM virtual workspace you are encouraged to do so by contacting G. Hinterleitner and requesting access.



**Mr. G. Hinterleitner**

Division of Radiation and Waste Safety  
 Department of Nuclear Safety  
 International Atomic Energy Agency (IAEA)  
 Wagramer strasse 5, P.O. Box 100  
 A-1400 Vienna  
 Austria  
 Phone: +43 1 260022743  
 Fax: +43 1 26007  
 E-mail: G.Hinterleitner@iaea.org

#### 5. ISAM CD ROM

As suggested, in the ISAM Co-ordinating meeting in November 1998, a first version of the CD-ROM version has been produced by the Brazilian Nuclear Energy Commission. The CD-ROM was also distributed among the participants during the Rio meeting. The CD-ROM has a 3D appearance and includes the following information:

- ISAM project information
- List of participants
- Technical documents (includes the first draft of the scenario and modelling and data working groups)
- Individual safety cases
- Questionnaires
- Computer codes

Prior to the Research Co-ordinating Meeting all participants are invited to: send information about their waste management programme to Mr. Heilbron or bring the information to the Research Co-ordinating Meeting meeting in Vienna (Feb 1999). This information will be included in the next CD-ROM version on the topic called "National Cases".

#### 6. REQUESTS FOR INFORMATION

<b>GENERAL</b>	If you plan to attend to the ISAM RCM in Vienna, please fill in your registration form and send it to Mss. Claire at the IAEA before 8 <sup>th</sup> January 1999.
<b>Confidence Building Working Group</b>	Please responds to the questionnaires. Copies are available in the ISAM Virtual Workspace. If you do not have access to it , please contact the WG leader
<b>Safety Cases</b>	If you would like to present a poster about your individual Safety Cases, please contact Mr. M. Kozak before 20 <sup>th</sup> of January 1999.
<b>ISAM CD-ROM</b>	Please be sure that you bring along with you information about your waste management programme (Videos, reports ..etc)

## 7. EDITORIAL NOTE

The ISAM Co-ordinating Group would like to transmit a message of appreciation and gratitude to all of our Brazilian colleagues who were involved in the organisation of the first ISAM Working Groups meeting.

It was an honour and a pleasure to meet them in Rio de Janeiro. They stressed the importance of the Agency's ISAM Project within the Brazilian radioactive waste disposal programme. In return we would like to tell them that the meeting organised by the Brazilian Nuclear Energy Commission was extremely important for the ISAM Programme and its scientific and technical progress.

The meeting was attended by 50 participants from 25 different countries. The overall organisation was excellent and the meeting a great success. The work carried out by **Ms. A.M. Xavier** and **Mr. P. Heilbron** was very professional and without them this achievement would not have been possible.



THANKS

## 8. ISAM DOCUMENTS

*Currently available ISAM documents*

**ISAM/NL/0196.-** ISAM Newsletter No 1. International Programme on Implementation of Safety Assessment Methodologies for Near Surface Facilities for Radioactive Waste. ISAM News. June 1996.

**ISAM/NL/0198.-** ISAM Newsletter No 2. International Programme on Implementation of Safety Assessment Methodologies for Near Surface Facilities for Radioactive Waste. ISAM News. March 1998.

**ISAM/MS/0198.-** ISAM Working Groups Meeting Summary No 1. 1<sup>st</sup> Working Groups Meeting of the International Atomic Energy Agency's Co-ordinated Research Programme for Improving Long Term Safety Assessment Methodologies for Near Surface Radioactive Waste Disposal Facilities (ISAM). Rio de Janeiro, Brazil, 26-31 July 1998.

**ISAM/G/0197.-** ISAM, The International Programme for Improving Long Term Safety Assessment Methodologies for Near Surface Radioactive Waste Disposal Facilities: Objectives, Content and Work Programme. April 1997.

**ISAM/G/0297.** ISAM Questionnaire. April 1997.

**ISAM/G/0397.** ISAM Questionnaire: Summary of responses. February 1998.

**ISAM/CB WG/0198.-** ISAM Project. Confidence Building Working Group. Questionnaire February 1998

**ISAM/CB WG/0298.-** ISAM Project. Confidence Building Working Group. Questionnaire April 1998.

**ISAM/CB WG/0398.-** Report on Application of QA Procedures to Safety Assessment for Near Surface Repositories. Version 0.0. July 1998.

**ISAM/CB WG/0498.-** ISAM Project. Confidence Building Working Group. ISAM Document review Record. July 1998.

**ISAM/CB WG/0598.-** ISAM Project. Confidence Building Working Group. Questionnaire on Communication. September 1998.

*Draft ISAM Documents*

**ISAM/SC/0198.-** ISAM Safety Cases. Version 0.0. April 1998.

**ISAM/SC/0298.-** Vault Safety Case. Version 0.0. November 1998.

**ISAM/SWG/0298.-** Development of an Information System for Features, Events and Processes (FEPs) and Generic Scenarios for the

Safety Assessment of Near Surface Radioactive Waste Disposal facilities. Version 0.2, November 1998.

**ISAM/MWG/0298.-** Model Formulation and Implementation, including Data. Version 0.2, November 1998.

*ISAM Papers*

**ISAM/Paper/0198.-** Uncertainty/Sensitivity Methodologies for Safety Assessments of Low-

Level Waste Disposal Facilities. F. Luiz de Lemos, T. M. Sullivan, J.H. Rowat, G. M. Dolinar. Waste Management 99. Tucson, USA. February 1999.

**ISAM/Paper/0298.-** The International Atomic Energy Agency Programme to Improve Safety Assessment Methodologies for Near Surface Radioactive Waste Disposal Facilities (ISAM). M.W. Kozak and C. Torres. Proc. DOE Low-level Waste Conf. 10-13 Nov, 1998 Salt Lake City.

**CO-ORDINATED RESEARCH PROGRAMME ON IMPROVEMENT OF LONG TERM  
SAFETY ASSESSMENT METHODOLOGIES FOR NEAR SURFACE  
RADIOACTIVE WASTE DISPOSAL FACILITIES (ISAM)**

**2<sup>ND</sup> ISAM RESEARCH CO-ORDINATION MEETING, PLENARY  
& WORKING GROUP MEETINGS**

IAEA Headquarters, Vienna, Austria  
1-5 February 1999

Please complete this form and forward it to Ms. C. Halsall (details given below) as soon as possible, but no later than **8 January 1999**.

Yes, I will attend the meeting .....	<input type="checkbox"/>
No, I will not attend the meeting .....	<input type="checkbox"/>

My personal data are:

Name:	
Organization:	
Address:	
Telephone:	
Fax:	
Email:	
<b>YES, I need a formal invitation letter for visa purposes .....</b>	<input type="checkbox"/>

<b>I wish that my details be removed from the ISAM mailing list .....</b>	<input type="checkbox"/>
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Ms. C. Halsall  
Waste Safety Section (Room B0717), Division of Radiation & Waste Safety  
International Atomic Energy Agency, Wagramer Strasse 5, P.O. Box 100, A-1400 Vienna, AUSTRIA  
Telephone: (+43 1) 2600-22692, Fax: (+43 1) 26007-22692  
Email: C.Halsall@iaea.org