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The Nuclear Energy Agency Database of Features, Events and Processes

Application by the Environment Agency

T.J. Sumerling, Safety Assessment Management

R&D Technical Report P97

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Statement of use
This report summarises the outcome of the Nuclear Energy Agency (NEA) FEP Database Project, and makes recommendations to the Agency for (1) participation in future related NEA initiatives and (2) the use of the NEA FEP Database by Agency. The information in this document is for use by EA staff in considering and formulating future work plans.

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The Nuclear Energy Agency Database of Features, Events and Processes

Application by the Environment Agency

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The Nuclear Energy Agency Database of Features, Events and Processes

Application by the Environment Agency

EXECUTIVE SUMMARY

Background

An international Working Group set up under the programme of the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (NEA of the OECD) has recently completed its work. The main deliverables from the project are Working Group reports, plus Version 1.0 of an "International FEP Database". The Database consists of a comprehensive list of factors (termed features, events and processes - FEPs) relevant to safety assessment of radioactive waste repositories, linked to a compilation of project-specific FEP records from (at present) seven projects and five countries. The Working Group has made recommendations for maintenance and development of the Database in the future programme of the NEA which have been broadly accepted by the NEA Performance Assessment Advisory Group (PAAG).

Environment Agency participation and this report

The Environment Agency have participated in the project via a technical contractor retained to participate in the Working Group, to carry out technical work and to prepare both working documentation and the final report of the Group. The costs of this work have been shared by seven organisations from six countries. This report summarises the main achievements of the project and benefits to the Environment Agency. It also makes recommendations on participation in related NEA initiatives and the use of the NEA Database by Agency. Supporting information can be found in the Working Group report to PAAG (appended to this report) and the final Working Group report (to be published by the NEA and available now in draft).

Conclusions and Recommendations

The International FEP Database is a valuable tool that the Agency should possess and may use in any review of an applicant's safety case for a radioactive waste repository in the UK. The author recommends that the Agency should:

- participate in future NEA activities related to the Database, in order to help guide its future development;
- obtain the Database and examine options for its use as discussed in Section 3.2 of this report.

The basic software and principle of the International FEP Database might also be applied to the assessment of non-radioactive solid and effluent disposals.

1. BACKGROUND

An international Working Group set up under the programme of the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (NEA of the OECD) has recently completed its work. The main deliverables from the project are Working Group reports, plus Version 1.0 of an "International FEP Database". The Database consists of a comprehensive list of factors (termed features, events and processes - FEPs) relevant to safety assessment of radioactive waste repositories, linked to a compilation of project-specific FEP records from (at present) seven projects and five countries.

The NEA FEP Database Working Group was set up by the NEA Performance Assessment Advisory Group (PAAG) in 1993. The Terms of Reference stated that the Group should:

- determine what FEP information is currently held by OECD member countries;
- decide what kind of information should be included in an international database and at what level of detail;
- define procedures for accessing and maintaining the database to be implemented by the NEA Secretariat.

In 1994, at the initiative of the PAAG Chairman, Mr. T. Sumerling was invited to participate in the Working Group and develop a proposal to PAAG for the continuation of the project. This initial participation was supported jointly by Nagra, Switzerland, the Swedish Nuclear Power Inspectorate and Her Majesty's Inspectorate of Pollution (HMIP). The PAAG meeting of October 1994 agreed, in principle, to an independent consultant carrying out technical work on behalf of the Working Group, and letters were sent to all PAAG members, inviting financial support for the work.

Seven organisations, from six countries, agreed to make financial contributions to the cost of the work, see Table 1. The costs were borne approximately equally by the seven partners, except that HMIP offered to make a small additional contribution to cover additional costs of reporting directly to HMIP and acting as a representative on behalf of HMIP at the Group.

Table 1 Organisations sharing the costs of work by Safety Assessment Management related to the NEA FEP Database.

Atomic Energy Canada Limited (AECL, Canada)
Agence Nationale pour la gestion des déchets radioactifs (ANDRA, France)
Empresa Naçional de Residuos Radioactivos (ENRESA, Spain)
Her Majesty's Inspectorate of Pollution (HMIP, United Kingdom)
National Co-operative for Radioactive Waste Disposal (Nagra, Switzerland)
Paul Scherrer Institute (PSI, Switzerland)
Swedish Nuclear Fuel and Waste Management Company (SKB, Sweden)

2. OUTCOME OF THE PROJECT

2.1 Main Achievements

As well as the general benefits of information exchange, the following deliverables will come from the project:

- the NEA International FEP Database;
- the report of the Working Group [ref. 1], which will be published as an NEA report.

In addition, a preliminary report of work by the Group was given at the 1996 American Nuclear Society Conference [ref. 2].

The principles of the NEA International FEP Database are outlined in a summary report to PAAG, which also includes recommendations for maintenance of the database and for review of recent developments in the field of scenario methodology. The report to PAAG is appended to this document.

The database, and work by the Group, is described in detail in the draft Working Group report. This has been sent to members of the Working Group and to members of PAAG for final comments, with a view to publishing as an NEA report [ref. 1].

2.2 Benefits to the Environment Agency

The Environment Agency has benefited by being represented on this important international technical group and receiving direct reports on the work. In addition, aspects of the Agency's assessment approach have been incorporated into the work.

- The classification scheme which was adopted to assist in the derivation of the International FEP List is based very closely on the system simulation scheme, initially devised for HMIP in the context of environmental simulation modelling and developed by Thompson [ref. 3].
- Prominence has been given to the system elicitation work for HMIP by Thorne [ref. 4], in particular, the importance of recording expert opinion on processes and in model development.
- The FEP catalogue developed by Miller and Chapman on behalf of HMIP [ref. 5] is one of the seven project-specific databases incorporated in the International Database.

This has raised the profile of the Agency's (ex HMIP) assessment work internationally, and ensured that the product is consistent with the Agency's current assessment approach.

Most importantly, the International FEP Database, can be a useful tool to assist in the dialogue between regulator and a proponent, see Section 3.2. This tool is now available to the Agency. Its value is increased because it is the product of international collaboration, i.e. it may be more readily accepted as a neutral starting point for a regulatory review process. Finally, the cost to the Agency has been relatively low since total costs have been shared by seven organisations.

3. RECOMMENDATIONS TO THE AGENCY

3.1 Participation in Related NEA Initiatives

The recommendations of the Working Group to PAAG fall into three categories:

(1) Reporting and dissemination of Version 1.0 of the Database.

(2) Maintenance and development of the Database.

(3) Review of developments in scenario methodologies.

These are detailed in the Working Group report to PAAG (See Appendix) and were broadly accepted at the October 1996 meeting of PAAG. With regard to these recommendations, the author makes the following observations and recommendations to the Agency.

3.1.1 Version 1.0 of the Database

The Agency will receive a copy of Version 1.0 of the Database as soon as it is available (estimated September 1997). At present, the Database is implemented on Claris FileMaker Pro Version 3.0 and it will be necessary to purchase this software (approximate cost £200) to take advantage of the menu and information screens.

Agency staff will need to decide whether to make use of the Database as described in Section 3.2 of this report.

3.1.2 Maintenance and development of the Database.

A Core Group is proposed which will have control of future development of the Database. It would be valuable to become a member of the Core Group, to ensure the database develops as a tool that will be useful in the dialogue between repository developers and regulators, and is consistent with the UK situation and the Agency's perspective. The expected cost of participation is of the order of £5000 over a two year period, to pay for contractor work, plus staff time and travel costs to enable a member of Agency staff to attend Core Group Meetings (see R8, p. 5, Appendix).

3.1.3 Workshop on scenario development

It should be understood that "scenario development" here means the processes of identification, screening and selection of FEPs, and their arrangement either into scenarios and scenario-specific models, or into a system model as favoured within previous HMIP assessments. This subject is central to development of credible assessment models. Thus, it is important to the Agency both in respect of its review of an applicant's assessment models and also in respect of any independent analysis to be carried out by the Agency.

PAAG have charged Dr. F. van Dorp of Nagra, Switzerland, with forming a co-ordinating group for a Workshop and drawing up a programme. It would be useful to follow developments in this area, and at an appropriate time, offer suggestions on the programme and also offer one or more paper for presentation at the Workshop. It is important that the perspective of regulatory review and consequent demands on scenario methodologies is vigorously represented, i.e. scenario development should not be an internal and hidden part of an applicant's safety case, but must be open to scrutiny and, possibly, discussion between applicant and regulator.

3.2 Use of the NEA Database by the Agency

The expected general uses of the International FEP List and associated project databases are as:

- an aid to achieving and demonstrating comprehensiveness within an assessment;
- a tool to interrogate individual assessments as well as to assist in comparing assessments.

More detailed suggestions for use are given in Section 3.7 of the Working Group report [ref. 1]. In particular, it is suggested that International FEP List may be used by reviewers to audit the scope of a completed assessment, or may be used as a starting point for discussion of assessment scope and completeness between a proponent and regulator.

3.2.1 Use in scientific and technical review

An important use of the database is as a starting point for scientific and technical review of an applicants' safety assessment.

The scope of the Database is quite general, and it may be necessary to review the list to assess its applicability to specific sites. This generic nature may, however, be an advantage. It does not pre-judge site-specific issues, and can be used as a tool to audit the broad scope of an applicant's documentation. The review of more detailed site-specific issues, identified by the applicant or by the Agency's review, is a second stage of the review process, c.f. [ref. 6].

An alternative, or perhaps parallel, approach is to use the International FEP List, together with basic waste, repository and site information supplied by the applicant, to carry out an independent system model elicitation. That is, to form an independent judgement on the scope of modelling and calculations that will lead to an adequate assessment of performance, c.f. [refs. 4 and 5].

3.2.2 Use in support of independent analysis

If the Agency opts to maintain an independent analysis capability, then the International FEP List may be used as:

- a list against which to audit the Agency's modelling and analysis capabilities;
- a starting point from which to derive site-specific conceptual system models, see [refs. 4 and 5].

The first use could be particularly important in view of the fact that Nirex must return to assessing a range of sites and repository concepts. The Agency may need a simple assessment capability that can cope with a range of geological environments and disposal concepts.

The second use may be relevant to possible independent analysis of the Drigg site.

3.2.2 Use of FEP Databases as a dialogue tool

A particularly interesting development could be the use of the International FEP Database, and project-specific FEP databases in general, as a tool to facilitate the technical dialogue between the Agency and a potential applicant. Nirex have developed the FANFARE system, which includes both FEP information and various diagrammatic techniques, as a tool to develop models and scenarios for analysis [ref. 7]; the developers at AEA have indicated they believe it would be an effective tool for communicating to regulators.

The advantage of such database systems over conventional documents is that, if properly constructed, a reviewer may navigate his way through the technical arguments and data more freely, following a path that suits his own specific enquiries and concerns. Whereas, Nirex may choose to make a version of FANFARE available to Agency, it would be advantageous for the Agency to possess an independent tool with similar capabilities. Thus, the Agency would not be constrained to operate on Nirex's system. Moreover, if the Agency possessed such a capability, it could be used as a tool to communicate to the public, as well as a platform for technical communication with an applicant.

The International FEP Database has been constructed without graphical display capabilities, for reasons discussed in the Working Group report. The system, however, might be linked to commercial software that provides this capability, e.g. the "Business Modeller" package used by the Swedish Nuclear Power Inspectorate in the SITE-94 exercise [ref. 8].

4. SUMMARY AND CONCLUSIONS

This is the final report to the Environment Agency under contract CPR2/41/1/182. Under this contract HMIP (latterly the Agency), together with six other partners, have jointly funded the work of Safety Assessment Management related to the development of the NEA International FEP Database.

The Database will be available later this year. This report provides suggestions to the Agency on:

- participation in related NEA initiatives;
- use of the NEA Database by Agency.

The International FEP Database can potentially be an important tool to assist in the dialogue between a regulator and a proponent. For this reason, the author recommends that the Agency should:

- participate in future NEA activities related to the database, in order to help guide its future development;
- obtain the Database and examine options for its use as discussed in Section 3.2 of this report.

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Appendix

NEA/PAAG/DOC(96)3

Organisation for Economic co-operation and Development

Draft : 22 October 1996

NUCLEAR ENERGY AGENCY
COMMITTEE ON RADIOACTIVE WASTE MANAGEMENT

PERFORMANCE ASSESSMENT ADVISORY GROUP (PAAG)

FEP DATABASE WORKING GROUP

SUMMARY REPORT AND RECOMMENDATIONS TO PAAG

The NEA FEP Database Working Group

Summary Report and Recommendations to PAAG

ABSTRACT

The FEP Database Working Group which was initiated in June 1993 will complete its work by the end of this year (1996). As well as the general benefits of information exchange, the following firm deliverables will come from the project:

- the NEA International FEP Database;
- the report of the Working Group.

The main recommendations of the Group are that:

1) the report of the Working Group should be published as an OECD NEA document, and version 1.0 the International FEP Database should be provided on request by the NEA Secretariat (R1-R2);

2) a Core Group should be set up to act as a focus for maintenance and development activities related to the International FEP Database, and to ensure the quality and consistency of additions to the Database (R3-R8); and

3) a Workshop should be arranged to review developments in scenario methodologies and application in safety assessments since 1992, and this should be the basis to prepare an overview of the state-of-the-art in this area (R9-R10).

More detailed recommendations and suggestions are given in Section 2 of this document.

CONTENTS

1. OUTCOME OF THE PROJECT

1.1 Conduct of the Study

The FEP Database Working Group was set up by PAAG as a follow-up activity to the Working Group on the Identification and Selection of Scenarios which reported in 1992 [1]. The FEP Database Working Group met seven times in the period June 1993 to October 1996. The meetings were attended by representatives from fifteen organisations and seven countries. In addition, detailed technical work has been done by a sub-group and by a consultant.

The discussions and interchange of information among the group has allowed the participants to:
- learn of the latest developments related to FEP identification and scenario development in other projects;
- obtain early informal peer review of their own work;
- set their own work in an international perspective.

Besides these general benefits, the following firm deliverables will come from the project:

- the NEA International FEP Database;
- the report of the Working Group.

A preliminary report of work by the Group has been given at the American Nuclear Society International High Level Radioactive Waste Management Conference, Las Vegas, 1996 [2].

1.2 The NEA International FEP Database

The NEA International FEP Database consists of two parts:

(1) ***The International FEP List*** – a list of factors relevant to the assessment of long-term safety of solid radioactive waste repositories, that attempts to be comprehensive within defined bounds. This forms a master FEP list and classification scheme by which to examine the project-specific database entries, see (2). A 'glossary' style definition is attached to each FEP.

(2) ***Project Databases*** – a collection of FEP lists and databases, with references, compiled during repository safety assessment and scenario development studies. Every FEP of each project database is mapped to one or more of the International FEPs.

Both parts are included as files in a computer database with simple screening and selection tools, and various screen display and print-out formats. Figure 1 illustrates how the International FEP List acts as a key to FEP descriptions and literature references held in project-specific databases. Alternative modes of use are facilitated by the simple database structure. In version 1.0 of the International FEP Database, seven project databases are included, see Table 1. The criteria for selecting these databases is that they are published lists or databases and, together, cover a range of solid waste disposal concepts.

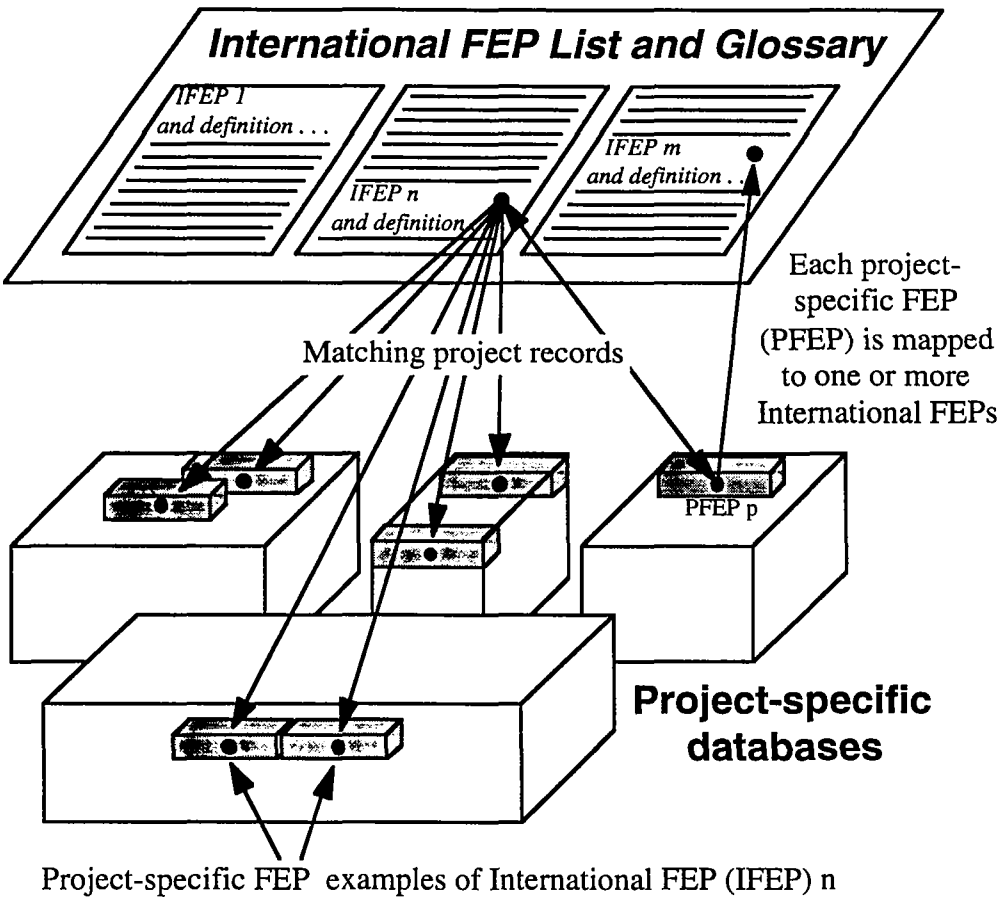

Figure 1 An overview of the International FEP Database, showing how the International FEP List acts as a key to FEP descriptions and literature references held in project-specific databases

Code	Comments	Ref.
SKIB89	the joint SKI/SKB database of 157 FEPs related to the Swedish KBS-3 spent fuel disposal concept	[3]
NEA92	example compilation of 150 FEPs (names only) relevant to deep geological repository that appears in the NEA Scenario Working Group report	[1]
HMIP92	the HMIP database of about 80 FEPs related to the assessment of disposal of low and intermediate-level waste in fractured hard rock	[4]
AECL94	the AECL database of about 250 FEPs (termed factors) related to the Canadian nuclear fuel waste disposal concept	[5]
NAG94	the Nagra database of about 240 FEPs related to the Kristallin-I assessment of disposal of vitrified high-level waste in the crystalline basement of Northern Switzerland	[6]
WIPP96	the USDOE database of about 240 FEPs related to the assessment of disposal of transuranic waste in bedded salt at the WIPP site	[7]
SITE94	the SKI database of about 165 FEPs related to the SITE-94 assessment of a hypothetical deep repository for spent fuel at the Äspö site	[8]

Table 1 Project databases included in the International FEP Database (version 1.0)

1.3 Report of the Working Group

A final report of the Working Group activities, focusing on the International FEP Database, its content, uses and development, will be produced. A draft of the report will be distributed at the PAAG meeting.

The Report and the International Database are currently under review by the Working Group. It is expected that final technical work will be complete by December 1996 and both deliverables will be ready for issue by February 1997.

2. RECOMMENDATIONS TO PAAG

Based on experience gained during the FEP Database Project, and related discussions, the Working Group makes recommendations to PAAG in three areas:

- dissemination of the deliverables from the Working Group;
- use, maintenance and development of the NEA International FEP Database;
- review of recent and ongoing developments in scenario methodologies.

In the following sections, **recommendations are given in bold type**; related comments and suggestions follow in normal type.

2.1 The Deliverables from the Working Group

R1 The Report of the Working Group should be issued as an OECD NEA document.

We believe the report is of sufficient interest in itself and will provide a useful reference to the work of the Group. In particular, it introduces the International FEP List which is a useful starting point for discussions on completeness of scope of assessments. The report also introduces the International FEP Database and should increase the interest in obtaining, using and adding to the Database. Moreover, both the report and Database are the result of consensus and work by an international group.

R2 The International FEP Database, Version 1.0, should be available on IBM PC (or Macintosh) diskettes from the NEA Secretariat on request, and a record should be kept of to whom copies of the Database have been sent.

Version 1.0 of the International FEP Database will be available as data files of a specific database software (Claris FileMaker Pro) and also as text files. Users must either have the specific software or must import the data into a database of their choice. We estimate that only a fraction of those who read the Working Group Report will wish to examine the database itself. In addition, it will be important to be able to stay in touch with users of the database, see R6. The diskettes should be accompanied by the basic information necessary to access the information plus a response form to encourage the submission of comments on Version 1.0 and possible improvements.

2.2 Use, Maintenance and Development of the International FEP Database

R3 We recommend to assessment groups that they examine the International FEP Database, Version 1.0, and, in due course (see below), submit FEP databases developed within their own projects for inclusion in the International FEP Database.

The International FEP Database is a product that should be of interest and use in repository safety assessment projects in many countries. The Database will become more useful as additional project databases are added to it. The aim is that each newly completed repository assessment or scenario development project in which a catalogue of FEP descriptions (and/or treatments) is developed should submit that database for inclusion in the International FEP Database.

R4 The International FEP Database should be both maintained and developed. In particular:
(a) a 'run-time' version of the Database should be produced;
(b) procedures should be put in place to ensure the quality and consistency of additions to the Database.

It would be advantageous to distribute future versions of the Database in the form of a 'run-time' code. Thus users would not need their own software to access the data, the interface could be better tailored to help users, e.g. with the use of menu screens and help facilities, and the data in the database could be better protected. Alternative 'run-time' versions might be developed, e.g. to allow search and examination only or to permit additional comments or project records to be added to a user's version.

It is important that a controlled version is maintained and that the quality and consistency of developments and additions to the Database are ensured. Some organisation and resources are necessary to achieve this.

R5 A 'Core Group' should be set up, under PAAG, whose members will specify and oversee developments of the Database and addition of new project databases. The Core Group will be responsible for overseeing a User Group plus paying and directing a technical contractor, see R6 and R7.

Many organisations with responsibilities for either waste management or regulation of waste management will find the International FEP Database useful and will benefit from its maintenance as an international resource. We believe that several organisations will be interested enough to participate in a Core Group which will specify and oversee developments and additions to the Database, and be willing to give financial support to pay for technical work to be carried out at the direction of the Core Group. The size of the Core Group is open, but we consider that a Group of between 4 and 8 organisations would be desirable.

The Core Group should meet to discuss the status of FEP database work internationally, possible uses, functions, control and dissemination of the International FEP Database, and the addition of project databases to the Database. Based on this discussion, the Core Group should outline a programme of technical work to progressively improve the function and utility of the International FEP Database. Thereafter, we expect that the Group would meet annually to oversee the programme.

R6 A register of users, or 'User Group', should be set up to encourage the use and dissemination of information related to the Database including updates and advice on capabilities and scope.

We believe that, in principle, the International FEP Database should be available to all organisations with an interest in repository safety assessment. It would be useful, however, to record to which organisations or persons the Database had been supplied and the use to which they were putting it; it would also be worthwhile to set up a mechanism by which users could return comments on their experiences and contact each other.

The form of a user group, and any entry requirement or fees, should be decided by the Core Group in agreement with NEA. A possible format would be a formal register of users maintained by the NEA Secretariat. Registered Users would receive updates of the International FEP Database as available, plus brief reports or newsletters describing developments or additions to the Database. A small fee might be necessary to cover administrative and material costs of supplying the Database if there is a practical way to collect this.

R7 We recommend that a technical contractor is retained through NEA to carry out maintenance and development tasks and prepare documents specified by the Core Group. The contractor costs should be recovered through payments from Core Group members to NEA, or directly to the contractor, through multi-party agreements.

Experience has shown that it is valuable to have a contractor to carry out specific technical tasks and to prepare documents required. This work may be appropriately assigned to a contractor because (1) the contractor has the responsibility and agreed resources to carry out the technical work in a timely fashion, and (2) the work is specified jointly by the Core Group and can rightly be claimed to be a product of an international consensus rather than of any one organisation. Thus, national organisations using the Database as a starting point or comparative tool in their studies can refer favourably to its international pedigree.

It is envisaged that the NEA Secretariat will be responsible for administrative support and distribution of working documents, reports and the Database copies, but the contractor will be responsible for providing the master materials.

R8 Initially, the Core Group members should commit resources sufficient to support the activities of the Group, including setting up of a User Group and technical work by a contractor, for a minimum period of two years.

A period of two years should be sufficient (1) to form a Core Group, (2) for the Core Group to specify a programme of work, select a contractor and agree to a budget, (3) for the contractor to produce a first 'run-time' version of the International FEP Database, (4) to decide the form of a User Group, and (5) to obtain and assess initial responses from users. The Core Group should meet initially, to agree a programme of work and estimate resources required, and thereafter as they see fit. The Chair of the Group should present the Group's recommendations for the continued maintenance, or otherwise, of the Database to PAAG in in October 1998.

The Working Group has discussed informally some options for the maintenance and development of the International FEP Database. We estimate that the *minimum* resource necessary to provide contractor support sufficient to act as a technical secretary to the Group over a two year period, carry out a basic level of development and make project record additions to the database is of the order of UK£ 30,000 (FFr 240,000). This indicates that a Core Group of about 6 member organisations, each prepared to commit participation of a member of staff plus contract funds of the order UK£ 5,000 (FFr 40,000) would be viable.

2.3 Review of Developments in Scenario Methodologies

During its discussions the Working Group has noted that, during the last few years, significant developments have taken place in the use of methodologies and tools to formalise and record the processes of scenario identification and selection. For example, the use of:

- the Rock Engineering System (RES) matrix method in Sweden, Finland, the U.K., and in the international BIOMOVS project;
- process influence diagrams (PID) in Sweden, and rather simpler influence diagrams in Switzerland;
- directed diagrams and the development of the FANFARE software system by AEA in U.K.;
- initiating event methodology for identifying and selecting scenarios within the CEC EVEREST project;
- event trees, scenario paths and illustrative graphics in the Yucca Mountain Project in the U.S.A.;
- formal elicitation, recording of conceptual model assumptions and tracking of model bias, e.g. in the U.K.;
- extensive FEP databases, e.g. in Switzerland, Sweden, the U.S.A (WIPP) and Canada.

The area of scenario identification is an area of fundamental importance to the comprehensive assessment of radioactive waste disposal and, in our opinion, continues to be an area in which international cooperation and exchange can be valuable. We stress that within the topic of scenario methodologies we include the methods for identification, selection and linking of FEPs within environmental simulation models that are used to generate alternative realisations of the future evolution of a disposal system, i.e. model-generated scenarios.

R9 We recommend that a Workshop is arranged to review developments in scenario methodology and application in safety assessment. The Workshop should focus especially on developments since the publication of the NEA Scenario Working Group report of 1992 [1].

Objectives for the Workshop would be:

- to review and discuss methods for scenario identification and their contribution to the overall formation of a comprehensive and justifiable safety assessment;
- to consider the available methods and compare their scope, consistency and function within the overall safety assessment process;
- to provide a basis from which to prepare a report summarising the current state-of-the-art in scenario methodologies, identifying where sufficient methods exist and any outstanding problem areas.

We believe that the Workshop should include:

- presentation of invited papers from organisations with recent experience of developing and/or applying scenario methodologies;
- discussion sessions on key common issues in scenario methodologies which would be seeded and guided by a questionnaire that should be circulated and completed before the workshop;
- parallel working sessions to draft position statements on key issues and define the state-of-the-art in these areas;
- plenary presentation and discussion of draft position statements.

Issues of common concern would be identified from analysis of the preliminary questionnaires, but might include topics such as:

- how to demonstrate 'completeness' or sufficiency of scope in an assessment;
- demonstration of traceability from data/information to assessment models and calculations in scenario identification and definition;
- use of expert judgement in scenario identification and definition;
- transparency of presentation of scenario identification and definition to different audiences, e.g. regulators, non-technical groups;
- the utility and (if useful) formulation of reference scenarios for repository assessment.

R10 We recommend that a Scenario Workshop Coordinating Committee should be formed under PAAG to take responsibility for organising the Workshop, including the preparation and analysis of preliminary questionnaires, plus preparation and editing of a Workshop Proceedings and Overview report.

We expect that the Coordinating Committee will discuss the organisation, attendance, timing and production of outputs from, and associated with, the Workshop. We suggest, however, that the following inputs and outputs may need to be managed:

- a questionnaire to identify issues of common concern and to explore views on issues identified initially by the Coordinating Committee;
- a compilation and/or preliminary analysis of the questionnaire answers;
- short written papers on scenario methodology and application in safety assessments prepared by the various national organisations;
- draft position papers on special issues prepared at the workshop;
- a short Overview Report on the state-of-the-art in scenario methodologies drawing together the position papers and results of plenary discussions;
- a Workshop Proceeding which might be prepared as a separate document or as an appendix to the Overview Report.

We suggest that the Coordinating Committee should consider retaining a contractor to assist in document drafting and editing, as this will assist in managing the timely production of inputs and outputs.

3. REFERENCES

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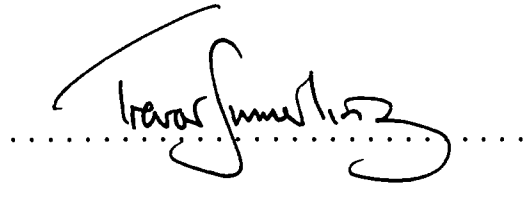

Date 10 July 1997

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