

December 16, 1994

MEMORANDUM TO: John H. Austin, Chief
Performance Assessment and Hydrology Branch

THRU: Norman Eisenberg, Section Leader
Performance Assessment and Health Physics Section

FROM: Rex G. Wescott, Sr. Hydrologist
Performance Assessment and Health Physics Section

SUBJECT: FOREIGN TRIP REPORT: FOURTH MEETING OF WORKING GROUP TO START AND OVERSEE DEVELOPMENT OF AN INTERNATIONAL DATABASE OF FEATURES, EVENTS, AND PROCESSES, PARIS, FRANCE, SEPTEMBER 6-7, 1994.

An abstract of my trip and a detailed trip report are attached. These documents present the discussions and conclusions reached by the working group to start and oversee development of an international database of features, events, and processes (FEPs). I believe that the working group has made significant progress and has set a goal of having a working international database by early 1996. At least three separate FEP databases have already been placed in electronic format.

Attachments: As stated

cc: J. Taylor, EDO
C. Stoiber, OIP
R. Bernero, NMSS
G. Arlotto, NMSS
R. Brady, SEC/ADM

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December 2, 1994

MEMORANDUM TO: Margaret V. Federline, Chief
Performance Assessment and Hydrology Branch

THRU: Norman Eisenberg, Section Leader
Performance Assessment and Health Physics Section

FROM: Rex G. Wescott, Sr. Hydrologist
Performance Assessment and Health Physics Section

SUBJECT: FOREIGN TRIP REPORT: FOURTH MEETING OF WORKING GROUP TO START
AND OVERSEE DEVELOPMENT OF AN INTERNATIONAL DATABASE OF
FEATURES, EVENTS, AND PROCESSES, PARIS, FRANCE,
SEPTEMBER 6-7, 1994.

An abstract of my trip and a detailed trip report are attached. These documents present the discussions and conclusions reached by the working group to start and oversee development of an international database of features, events, and processes (FEPs). I believe that the working group has made significant progress and has set a goal of having a working international database by early 1996. At least three separate FEP databases have already been placed in electronic format.

Attachments: As stated

cc: R. Bernero
M. Knapp
J. Greeves
OIP
EDO
SEC

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DATE	12/5/94		12/17/94	1/94		1/94

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TRIP REPORT ABSTRACT
DATE OF REPORT

OFFICIAL TRAVELER:
Rex G. Wescott

TRAVEL TO: OECD/NEA
Paris, France

BEGINNING ON: 9/4/94
ENDING ON: 9/8/94

OFFICE: Nuclear Material Safety and Safeguards
Performance Assessment and Hydrology Branch
Division of Waste Management

MEETING TITLE AND/OR AFFILIATION:

Working Group to Start and Oversee the Development of an International Database of Features, Events, and Processes (FEPS), PAAG, NEA

ORGANIZED BY: NEA

Rex G. Wescott, Senior Hydrologist, PAHB, DWM, NMSS participated as a working group member from the USA at the fourth meeting of the working group to Start and Oversee the Development of an International Database of Features, Events and Processes (FEPS). The working group meetings took place during the morning and afternoon of September 6 and 7, 1994, at the new NEA offices at Issy-les-Moulineaux. Other members of the group included Pablo Thorner of France (ANDRA), Marie Wiborgh of Sweden (KEMAKTA), Fritz van Dorp of Switzerland (NAGRA), D. E. Billington of UK (NIREX), Martin Kelly of UK (NIREX), Trevor Sumerling of UK (HMIP), George Barr of Sandia (DOE, Yucca Mt.), Timothy Hicks of Galson Sciences Ltd. (DOE WIPP), and Bertrand Ruegger NEA representative.

Major actions undertaken by the group included appointment of a chairperson (F. van Dorp), reviewing the last meeting summary and homework from working group members especially in regard to data availability, demonstration of various data base tools, commenting on a draft working paper for the group, and planning future activities.

Major accomplishments, to date, included finalizing an initial working paper describing the development of the database, finalizing a progress report for presentation to the PAAG, and setting up a Program Plan which sets as a goal having a working database by early 1996.

DETAILED TRIP REPORT OF:

**Rex G. Wescott, Senior Hydrologist
Performance Assessment and Hydrology Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards**

SUBJECT: Trip Report on Working Group to Start and Oversee Development of an International Database of Features, Events, and Processes (FEPs), Paris, France, September 6-7, 1994.

Rex Wescott participated as a member at the fourth meeting of the working group to Start and Oversee an International Database of Features Events and Processes (FEPs). The primary purpose of this meeting was to examine databases and papers supplied by participants and to consider ways to merge national databases. Computerized FEP lists were supplied by representatives from Sweden, Switzerland, and USA (Yucca Mt.). FEP lists from France, Canada, and UK are expected soon. Trevor Sumerling of Safety Assessment Management (UK, HMIP) wrote a paper entitled "Development of an International FEP Database" for consideration by the working group for use as a progress report for the FEP project.

The meetings were held at the new location of NEA in the Seine-St. Germaine Building in Paris, France on September 6-7, 1994. Working group members in attendance included George Barr (Sandia), Pablo Thorner (ANDRA, France), Marie Wiborgh (KEMAKTA, Sweden), Fritz van Dorp (NAGRA, Switzerland), David Billington (AEA, UK), Martin Kelly (AEA, UK), Trevor Sumerling (HMIP, UK), Timothy Hicks (WIPP, USA) and Bertrand Ruegger (NEA staff).

The first item of business was to act on a suggestion by B. Ruegger that F. van Dorp be appointed Chairman of the working group. After this was done, an agenda was proposed consisting of:

- (1) review of the summary for the meeting of March 1-2, 1994;
- (2) review of homework from the last meeting;
- (3) demonstrations by working group members with PC's showing database operation;
- (4) reassess objectives of FEP database;
- (5) discuss Trevor Sumerling's paper; and
- (6) decide upon a forward program and schedule to present to the PAAG.

The remainder of the morning of September 6 was spent reviewing the last meeting summary and the homework accomplished by group members after the last meeting. In regard to the meeting summary, the list of participants was updated (Martin Kelly was inadvertently left off the list of attendees). It was also suggested that in regard to the discussion of file manager programs such as "File Maker" and AskSam that we remove the sentence that they are not suitable to implement influences or a hierarchical structure. (I am not familiar with either program.) The only technically significant comments were in regard to the "Table of FEP Databases and Availability" and consisted of suggesting that the table be corrected to reflect that data for Sellafield in the UK may not be available, and names of FEPs for the LILW clay site (HMIP) should be available in Fall 1994.

In regard to the homework, B. Ruegger informed the group that he received letters expressing interest in the database from Belgium, Finland, and the

Netherlands (copies of letters attached). Also F. van Dorp committed to check with Spain and Germany regarding their interest in participating. T. Sumerling mentioned that data from Dry Run 3 is available and can be supplied. G. Barr mentioned that he was supplying a diskette with 148 FEPs accessible using Visual Basic. P. Thorner is supplying 53 FEPs from methods and scenarios. Tim Hicks noted that he was developing a position paper on Scenario Development on Post Closure PA for WIPP using the SKI/SKB FEP list. He also added a category of FEPs related to seals. The report should be available soon. M. Wiborgh mentioned that Christina Lilja (regular SKI representative) was sending 35 fully documented FEPs with influence diagrams using the "Toolbook" program. D. Billington mentioned that he planned to submit a FEP list from the two Scottish sites. F. van Dorp talked briefly about FEPs being developed as part of the methodology for defining a reference biosphere for specific repositories. It was my understanding that the biosphere to be developed will be site specific and change with time in accordance with a limited set of site specific processes still to be determined in a generic sense.

After lunch, presentations were made by George Barr, Martin Kelly, and Tim Hicks. The presentation by George Barr consisted of using the commercial computer programs "Access" and "Visual Basic" to graphically show the relationships between the various FEPs from Yucca Mountain. Martin Kelly and Tim Hicks both used the commercial computer program "Toolbook" to show the same types of relationships with their respective databases. Hicks used a "hardwired" approach where the inter-relationship between FEPs were predetermined and Kelly demonstrated a "dynamic" approach which allowed the user to make various connections between established FEPs and view the results. According to the discussion, the various database programs could exchange data using their own conversion utilities. I thought the "hardwired" "Toolbook" approach was the most useful where the various relationships or influence lines would be prepared by the database author and an information label can be prepared for each influence line as well as each FEP. I was hoping to see a database where the influence lines could be automatically changed for various types of repository conditions or scenarios as a part of the database. However, it appears that different countries (and perhaps organizations within the same country) may attach different labels to the same FEP or may tend to describe the same FEP in different ways. With this reality in mind, I now tend to favor the hard wired approach even though it will almost certainly require a separate data file for each repository and possibly repository scenarios.

After the demonstration of databases, F. van Dorp and D. Billington led a discussion to reassess what a FEP list should be. Most working group members still considered the most important function of the FEP list to be a check on completeness. The next function mentioned was to assist an organization just starting to consider a repository. After we went around the table, I used my meeting report of the first meeting to compare the benefits of a database as we originally listed them with the results of this discussion. For the most part, the results were similar and somewhat more conservative (we appear to be expecting less out of it), however, we have also made a number of decisions as to how to focus the problem and get it done.

The next day's meeting (Wednesday Sept 7) started with a discussion of Trevor Sumerling's proposed report for the committee. The major comments on the report were to:

- (1) reassess the objectives of the FEP list provided in Section 2,
- (2) Take the developments out Section 2 and add them to section 3, and
- (3) Add "(a) recommend formats for FEPs and accompanying information" and (b) include a table of keywords under 4.2 Preferred Actions.

There was more discussion about keywords and it was suggested that keywords to be looked for in the text of the FEP descriptions may be used as a means of integrating existing project databases. This seems like a good idea and if it works, may help solve the earlier mentioned problem of different labels for the same FEP (in the discussion about database demonstrations).

Trevor Sumerling said that he would attempt to re-write the paper incorporating the groups comments and distribute it to the group in October.

The last agenda item for the meeting was to determine a Program Plan.

We are to send any additional comments to T. Sumerling on his paper by the end of September. Since this meeting, the revision to the paper has been distributed with comments due in February 1995.

We determined that by January 16, that D. Billington, F. van Dorp, and T. Sumerling will attempt to formulate a new set of FEP categories in which the FEP lists will fit (we are presently using the SKI categories).

These categories will be discussed at our next meeting to be held March 15-16, 1995. In addition, we will discuss a list of "International FEPs" (non-project specific or generic FEPs), Trevor's paper and comments, progress in member countries, and design of the database.

We also expect to have an Autumn meeting in 1995 and a working database by early 1996.

Attached is a copy of the revision of T. Sumerling's paper entitled "Working Document on Behalf of the NEA FEP Database Working Group Development of an International FEP Database"; the progress report to PAAG; and copies of letters from Belgium, Finland, and the Netherlands regarding the databases.