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MEMORANDUM FOR: Margaret V. Federline, Chief
Hydrology and Systems Performance Branch
Division of High-Level Waste Management

THRU: David Brooks, Section Leader
Hydrologic Transport Section
Hydrology and Systems Performance Branch
Division of High-Level Waste Management

FROM: Rex G. Wescott, Sr. Hydrologist
Hydrologic Transport Section
Hydrology and Systems Performance Branch
Division of High-Level Waste Management

SUBJECT: FOREIGN TRIP REPORT: WORKING GROUP TO START AND OVERSEE
DEVELOPMENT OF AN INTERNATIONAL DATABASE OF FEATURES,
EVENTS, AND PROCESSES (FEPs), PARIS, FRANCE, JUNE 17-18,
1993.

An abstract of my trip and a detailed trip report are enclosed. These documents contain the results of discussions and conclusions reached by the group. I consider the database to be of potential value to the Nuclear Regulatory Commission and recommend continued participation in the working group.

Also attached is the draft agenda for the Performance Assessment Advisory Group (PAAG) meeting in Paris, September 14-16, 1993.

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Rex G. Wescott, Sr. Hydrologist
Hydrologic Transport Section
Hydrology and Systems Performance Branch
Division of High-Level Waste Management

Enclosure:
As stated

cc: J. M. Taylor, EDO
J. Brady, SEC/ADM
C.R. Stoiber, IP
G. Arlotto, NMSS
J. Youngblood, HLWM

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TRIP REPORT ABSTRACT
DATE OF REPORT
07/26/93

OFFICIAL TRAVELER:
Rex G. Wescott

TRAVEL TO: OECD/NEA
Paris, France

BEGINNING ON: 6/14/93
ENDING 6/19/93

OFFICE: Nuclear Material Safety and Safeguards
Division of High-level Waste Management
Hydrology and Systems Performance Branch

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, HLHP, DHLWM, NMSS, participated as a working group member from the U.S.A. at the initial 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 June 17 and 18, 1993. Other members of the group included Dr. Holly Dockery (Sandia), Dr. Dan Galston (DOE WIPP), Dr. Bruce W. Goodwin, (AECL, Whiteshell, Canada), Dr. Frits Van Dorp (NAGRA), Dr. Johan Andersson (SKI), Dr. Christina Lilja (SKI), and Mr. Bertrand Ruegger (NEA staff member). The purpose of this initial meeting as described by Mr. Ruegger was to "Determine if an International Database of FEP's could be created. And, if so, how? The working group determined that an international database could be created and is testing this assumption by requesting each of the participants to attempt to fit their own list of FEPs to the SKI database, an existing database where published FEP lists from other countries have already been compiled. This assignment is to be completed by the end of August 1993. The question of "How" was answered by making a list of possible database requirements and assigning each of them to a level from one to four, level one being the most basic requirements and level four representing the most elaborate considered to be reasonable. The working group picked level two to represent a level of sophistication thought to be adequate and feasible at this time.

In addition to answering the basic question posed by the PAAG, the working group discussed and made lists regarding scope (waste disposal categories), users, recommendations, benefits, and implementation issues. Mr . Ruegger noted the groups findings and recommendations and will present a report to the next PAAG meeting to be held September 14-16, 1993. The group has tentatively scheduled another working group meeting for November, 1993.

DETAILED TRIP REPORT OF:

Rex G. Wescott, Senior Hydrologist
Hydrology and Systems Performance Branch
Division of High Level Waste Management
Office of Nuclear Materials 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, June 17-18, 1993.

Rex Wescott participated as a member at the initial meeting of the Working Group to Start and Oversee an International Database of Features, Events, and Processes (FEPs). The purpose of this meeting, as explained by Mr. Bertrand Ruegger, NEA staff member assigned to the group, was to determine "if an international database of FEPs can be created, and, if so, how? Initial presentations (copies attached) by some working group members helped to focus the group on the most important items and facilitated the preparation of lists of recommendations developed by the group over the next two days.

The meetings were held at the new location of NEA in the Seine-St. Germaine Building in Paris, France on June 17-18, 1993. Working Group members included Dr. Holly Dockery of Sandia National Laboratory, Dr. Bruce Goodwin, of Atomic Energy of Canada Limited, Whiteshell, Dr. Johan Andersson, SKI, Sweden, Dr. Christina Lilja, SKI, Sweden, Dr. Frits van Dorp, NAGRA and Dr. Dan Galston, DOE WIPP.

Over the next two days, the working group discussed and listed points on the following topics:

- Hierarchical requirements for the database.
- Potential benefits of the database.
- Users and scope of the database.
- Implementation of the database.
- General Recommendations

Most of the time was spent on developing the list of requirements for the database. Four levels of sophistication were considered with level one being the most basic and level four the most advanced. These levels and their respective requirements were broken down as follows:

<u>Level One</u>	<u>-Provides ability to check assessment specific FEP list against NEA database.</u>
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- Must contain a comprehensive list of FEPs.
- FEPs should have text descriptions where necessary.

- The database must be searchable according to keywords provided with entries.
- The database must have a mechanism for periodic updating and providing feedback from users to the database.
- The database must have an appropriate QA program.
- The database must be easy to use.
- The software required to use the database must be readily available.

Level Two -Provides ability to check FEP interactions incorporated in National Assessment against NEA database.

- Must contain a comprehensive list of FEPs and the interactions between them.
- Must be searchable according to interaction.
- There must be screening arguments for FEPs, for example, the ability to screen FEPs by climate, geographical location, and etc.
- The database must contain references to publications and organizations for FEPs.

Level Three -The database may be used as a screening tool for FEPs and their interactions.

- There must be screening arguments for FEP interactions.
- Levels of importance may be assigned to FEPs and interactions which could depend on climate, geographical location, and etc.

Level Four -Allows direct graphical utilization of results.

- Graphical User Interface.

The working group concluded that Level 2 was the most reasonable initial objective for database complexity.

In regard to benefits of the database, the following were determined to be generally applicable:

- The database may be used directly for performance assessment by providing the initial data necessary for scenario construction.

- Use of the database should require less effort for beginning countries.
- The database should help to identify differences in performance assessments performed by different countries or at different stages.
- The database should help to provide proof of completeness from a regulatory perspective.
- The database can be used as a starting point for peer reviews and QA audits.

The scope of disposal applications over which the database will be applicable were determined to be deep disposal of high-level and intermediate-level waste and near surface disposal of low-level waste. There was also the suggestion that the FEP list could contain events and processes for the operational phase. In regard to users, it was determined that the database should be primarily useable by performance assessment staff of the licensee and the regulator. It was also decided that the database should be useable to the informed technical community as opposed to the informed public.

The working group also listed two issues concerning implementation which would have to be addressed in future meetings. These issues were the need to better define the structure of the database and the collection of information for the database. The issue of information collection would include: who is to provide information, who is to review the information, who is to collect and put the information into the system, and in what form should information be provided. These issues can probably be resolved with the QA program requirements.

Finally the working group made a list of general recommendations including participation and funding. These recommendations were:

- The outline structure, when developed, should have a wide review.
- Add France and UK to the working group.
- PAAG should consider further work on scenario development methodologies given advances in thinking since 1992 working group report.
- PAAG should consider funding levels of one half year from NEA. Participation levels from member countries can be determined after the task is formulated in more detail.

The working group decided that for homework, every member should try to fit their own list of FEPs to the existing SKI database structure as a test of the applicability of a general structure. If required, working group members are to consider other top-level structures. This homework is to be completed by the end of August and the results sent to Bertrand Ruegger before the PAAG meeting.

Before the meeting adjourned, there was a brief discussion regarding dose pathway FEPs. Based on earlier discussions with Robert Neel of HLHP, I noted that flexibility would be an important consideration because of various countries desires for either a static or changing biosphere. This point was agreed to and there was no further discussion of pathway FEPs.

All in all the meeting was very successful, providing details and justification that Bertrand Ruegger will be able to use in explaining the working groups activities to the PAAG during the meeting of September 14-16, 1993.

The next meeting of the working group was scheduled for November 22-23, 1993.