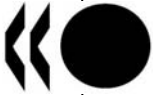


Unclassified

NEA/RWM/IGSC(2004)11



Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

02-Sep-2004

English - Or. English

NUCLEAR ENERGY AGENCY
RADIOACTIVE WASTE MANAGEMENT COMMITTEE

NEA/RWM/IGSC(2004)11
Unclassified

Integration Group for the Safety Case (IGSC)

ENGINEERED BARRIER SYSTEMS (EBS) Workshop on PROCESS ISSUES

**Las Vegas - USA
14-17 September 2004**

This workshop is organised by the OECD/Nuclear Energy Agency in co-operation with the European Commission and hosted by U.S. Department of Energy, Office of Civilian Radioactive Waste Management

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English - Or. English



U.S. Department of Energy
Office of Civilian Radioactive Waste Management

*Engineered Barrier Systems (EBS):
Workshop on*

PROCESS ISSUES

LAS VEGAS - USA
14 - 17 SEPTEMBER 2004

**A workshop organised by the
OECD/Nuclear Energy Agency**

**in co-operation with the
European Commission**

**and hosted by
US-DOE**

Final Programme

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1. INTRODUCTION

In 2001, the Integration Group for the Safety Case (IGSC) of the Nuclear Energy Agency (NEA) wished to reassess the need for a project to develop a greater understanding of how to achieve the necessary integration for successful design, construction, testing, modelling, and performance assessment of engineered barrier systems (EBS)¹.

To this end a workshop was held under the joint auspices of the EC and the NEA, hosted by United Kingdom Nirex Limited (Nirex), at Keble College, Oxford on 25-27 September 2002. The workshop provided a status report on engineered barrier systems in various national programmes (EC-NEA 2003) and defined the outline scope, timetable and *modus operandi* for a continued international project on the EBS.

The EBS project is being progressed through a sequence of further workshops as follows:

Workshop 1: Design Requirements and Constraints.

Workshop 2: Process Issues:

- Thermal management and analysis.
- Alteration of non-metallic barriers and evolution of solution chemistry.
- Radionuclide release and transport.

Workshop 3: Role of Performance Assessment and Process Models.

Workshop 4: Design Confirmation and Demonstration.

At the 4th IGSC meeting of 2002, the IGSC members agreed to continue with a project including a series of workshops as proposed above.

This paper presents the programme for Workshop 2 in the sequence, which will consider "EBS Process Issues."

2. GENERAL CONTEXT

The safety strategy for geological disposal of radioactive waste generally relies on a multi-barrier system. The purpose of this disposal system is to contain the waste and isolate it from the biosphere. This safety strategy enhances confidence that the waste will be successfully managed and disposed. The multi-barrier system comprises the natural barrier provided by the geological environment, and the engineered barrier systems (EBS).

The EBS may itself comprise a variety of sub-systems or components, such as the waste form, canister, buffer, backfill, seals, and plugs. The purpose of an EBS as a whole is to prevent and/or delay the release of radionuclides from the waste to the repository host rock. Each sub-system or component

1. The "Engineered Barrier Systems (EBS)" represents the man-made, engineered materials placed within a repository, including the waste form, waste canisters, buffer materials, backfill, seals, and plugs. The "near field" includes the EBS as well as the host rock within which the repository is situated to whatever distance the properties of the host rock have been significantly affected by the presence of the repository. The "far field" represents the geosphere beyond the influence of the repository [EC-NEA, 2003].

has its own requirements to fulfil, either by providing the initial isolation of the waste (e.g., the waste canister), or by providing or by providing retardation and retention capabilities once the waste is in contact with water, or by providing favourable conditions so that other barriers can fulfil their intended function (e.g. the buffer surrounding the canister).

Assessment of EBS performance requires process models that describe how the EBS and near field behaves under anticipated repository-relevant conditions. These process models must describe coupled hydrologic, thermal, chemical, transport, and mechanical processes. In addition, the future evolution and potential disruption of the environmental conditions in the near field and EBS must be considered. Such an integrated assessment of the EBS is further complicated by uncertainties that arise from incomplete understanding of processes, limited information, and lack of data. A systematic approach to EBS model development must be taken to alleviate these complexities, to ensure adequacy of EBS models, and to help build confidence in a safety case.

A systematic approach to EBS model development and EBS assessment should include the following key elements:

1. Implementation of a FEPs Approach –

Assurances must be provided that the selection of FEPs, and the exclusion of FEPs, have been carefully and correctly done in a systematic, traceable manner. Those FEPs that are not excluded should be represented in the EBS models.

- Identify potentially relevant FEPs
- Screen FEPs using defined criteria
- Construct relevant scenario classes

2. Quantification of Uncertainty and Variability –

Uncertainty is an inherent part of EBS studies. Information gathering activities should be directed at reducing uncertainty as much as is practical. However, because of variability in the near field and EBS, and limited understanding about how processes will operate in the future; uncertainty cannot be totally eliminated and should be explicitly addressed in assessments of the EBS.

- Epistemic uncertainty – arises because of imperfect knowledge, can be reduced by additional information
- Aleatory uncertainty – arises from limited understanding of how processes operate, cannot be reduced by additional information
- Model uncertainty – arises because of incomplete understanding and characterization of FEPs
- Data uncertainties- arises because of epistemic and aleatory uncertainties
- Heterogeneity in physical and performance characteristics
- Consistent treatment of uncertainties between EBS models
- Conservative assumptions – deliberately made to be “conservative” or to bound values for input parameters and/or processes

3. Sensitivity Analyses –

Many EBS processes are complex and/or nonlinear and model input parameters are uncertain and/or variable. It is difficult to obtain an understanding of what the critical uncertainties and sensitivities are from a simple evaluation of model results. To this end, a structured approach must be used to examine sensitivity of model results to uncertainties and assumptions in model inputs.

- Determine which uncertain variables have greatest impact on the overall uncertainty in model outcomes.
- Determine variables, which have greatest impact on the overall outcome of the models.
- Examine what happens when the system is stressed via unfavourable parameter values, assumptions, or alternative conceptualizations.
- Help identify relevant aspects of individual process models for incorporation into the TSPA analyses.

4. Model Validation and Limitations –

Case needs to be made that the models adequately (reasonably or conservatively) represent the behaviour of the EBS – on the basis of process understanding, examination of alternative conceptualizations, data, justification of assumptions and simplifications, analogues, selection of inputs, reasonableness of outputs, and sensitivities

3. WORKSHOP AIMS

The focus of this workshop is not on the “science” of processes relevant to the EBS, but rather on how processes are determined to be important, how they are considered in the design and performance assessment of the EBS, and how they are accounted for in a systematic, defensible, and traceable manner. The outcome of the workshop will also provide an input for discussion at the subsequent Workshop on the Role of Performance Assessment and Process Models.

The goals of the workshop are to:

- Share ideas and experiences in the consideration and implementation of the four key elements of EBS model development outlined in the previous section.
- Promote a common understanding of what the four key elements entail and to seek approaches to their implementation.
- Discuss specific examples where one or more of the key elements have been implemented in the context of EBS assessment.
- Propose and discuss additional and/or alternative elements of EBS model development and analysis that will help build confidence in the safety case.

These goals will be met by addressing the four key elements in the context of four working groups.

The following main topics of the working groups are envisaged:

Working Group A: Pre-closure Processes

Processes that occur during the pre-closure phase due to repository construction and operations establish the initial and boundary conditions for post-closure analyses. For example, excavation and other construction activities could cause groundwater chemistry changes within tunnels due to the impact of contaminants such as explosive residues or other organic contaminants. Important issues to be considered by this working group include:

- Non-conformance of emplaced EBS and structures.
- Perturbations to repository environment.
- Mechanical effects of excavation/construction in the EBS.
- Chemical effects due to the operation of the repository.

Working Group B: Thermal Management and Analysis

After permanent closure, the heat produced from radioactive decay of the nuclear waste will modify the temperature of the system, which in turn will affect the thermo-hydro-mechanical-chemical evolution of the system through different coupled processes. In the medium term (hundreds of years) and long term (thousands of years), subsequent changes in environmental conditions and alterations in properties of EBS materials may have an adverse effects on EBS performance. To prevent adverse changes in EBS performance due to thermal effects, thermal criteria (e.g., peak waste package temperature) are typically specified. This working group should discuss thermal criteria as well as the following important issues:

- What are the thermal criteria and how do you assess the validity of the criteria?
- How do you show that you meet your criteria during the post-closure phase?
- Should criteria be specified in terms of temperature, power density or some other measure?

Working Group C: Alteration of non-metallic barriers and evolution of solution chemistry

The lifetimes and performance of engineered barriers will depend on the chemical conditions to which they are exposed. Important processes affecting the chemical environment changes potentially include thermal loading, microbial activity, and interactions between solution composition and engineered materials. Most of the emplaced materials will be very different in chemical composition from the host rock. In particular, reactions with waste package outer barriers, waste package internals, and waste forms may alter water compositions. In turn, chemical changes to the EBS environment may affect the amounts and types of mobile radionuclides and the properties of the solids to which they are transported. This working group should discuss the potential alterations of the EBS components as well as the following relevant issues:

- Compatibility of seal and backfill materials with other components.
- Relevant geometry and boundary conditions for criticality assessment.
- Medium- and long-term alterations to engineered barriers.
- Alterations due to the thermal phase.
- Alterations due to interactions with host rock solutions.
- Alterations due to gas production by the waste package.

Working Group D: Radionuclide release and transport

A primary objective of the EBS is to prevent (or minimize) and delay the release of radionuclides from the EBS to the geologic system. How and when releases occur are important factors in the overall performance assessment of a repository. These factors are controlled by the chemical environment in the EBS, degradation of the waste package and waste forms, flow through the EBS, and retention properties of the EBS buffer and backfill materials. In addition, temporal and spatial changes in environmental conditions and the evolution of EBS material properties may play an important role in radionuclide release and transport. Important issues to be considered by this working group include:

- Release of radionuclides from the waste forms.
- Radionuclide retention processes within the waste package and EBS.
- Modelling the interface between the EBS and near-field host rock.
- Effect of geometrical changes of the waste package due to the corrosion.
- Effect of gas production from waste packages.

4. WORKSHOP STRUCTURE

- **Visit of the Yucca Mountain site on 14 September 2004:**
US-DOE will host the workshop in Las Vegas, and there will be an opportunity to visit the Yucca Mountain site. Following the site visit, the workshop will last for a further two and a half days, and will be structured as follows:
- **Plenary Session on 15 September 2004:**
The first day of the workshop proper will comprise a plenary session devoted to presentations related to the theme of the workshop and short discussions. The plenary session will begin with a US-DOE presentation on the overview of the YUCCA MOUNTAIN project and this will be followed by a series of oral presentations discussing practical examples of topics A, B, C and D as described in chapter 3. Presentations will be 30 minutes in length followed by 10 minutes for discussion.
- **Working Group Sessions on 16 September 2004:**
The second day will be devoted to Working Group Sessions. Working Groups will be reminded of their objectives and intended means of working at a brief introductory plenary session at the start of the day. The topics of the Working Groups are described in Chapter 3. The Working Groups will be asked to address a small number of key questions relevant to their topic. Each Working Group will include a range of relevant specialists with expertise in process issues and safety assessment, as well as both implementers and regulators.
- **A Round-Up Plenary Session on 17 September 2004 Morning:**
The morning of the third day will comprise a Round-Up Plenary Session at which the Working Groups will report back to the full workshop on general lessons that can be drawn regarding the key questions. The day will continue with a plenary discussion on the findings from both of the previous days. It will include discussion of any recommendations for the subsequent EBS Project workshops and agreement of logistical steps for publication of workshop proceedings.

5. WORKSHOP CHAIRPERSONS AND RAPPORTEURS

A chairperson, who will be assisted by a rapporteur, will lead all workshop sessions. Chairs and rapporteurs for the plenary sessions have been nominated and identified in the provisional agenda. Chairs and rapporteurs for the working group sessions will be determined prior to the workshop by the Workshop Programme Committee based on nominations from organisations intending to participate in the workshop and these will be identified in the final programme, which will be sent two weeks before the workshop at later.

In the plenary sessions, the work of the chairpersons will be to introduce speakers, keep the session on schedule, keep in mind the objectives of the workshop, and motivate participants for discussion. During the plenary session, the rapporteurs will maintain a record of the discussions for subsequent use in developing the workshop proceedings.

Before the workshop, Working Group Chairs will need to assimilate the information provided by those organisations participating in the EBS project and to prepare a brief presentation to stimulate the Working Group's discussions. During the workshop, Working Group Chairs will have the role of leading the work of their group and ensuring that all participants will have the opportunity to share their experience, and that the group remains focussed on the key issues. On the third day of the workshop, the Working Group Chair will present the findings of the group to the full workshop that will be prepared in collaboration with the Rapporteur.

Working Group Rapporteurs will maintain a record of the group's discussions for use in developing the presentation on the last day. Working Group Rapporteurs will also develop the first draft of a written contribution for inclusion in the workshop proceedings. The first draft of this written contribution will be reviewed first by the Working Group Chair and then by the full membership of the Working Group, prior to development of an agreed version.

6. WORKSHOP PROGRAMME COMMITTEE

The Workshop Programme Committee consisted of:

JOHNSON Lawrence	Nagra, Switzerland	lawrence.johnson@nagra.ch
MAC KINNON, Robert	SNL, USA,	rjmacki@sandia.gov
PLAS, Frédéric	Andra, France	frederic.plas@andra.fr
RAYNAL, Michel	EC	michel.raynal@cec.eu.int
SELLIN, Patrick	SKB, Sweden	skbps@skb.se
STORCK, Richard ²	GRS, Germany	sto@grs.de
TOVERUD, Oïvind	SKI, Sweden	toverud@ski.se
UMEKI, Hiroyuki	NUMO, Japan	humeki@numo.or.jp
VAN LUIK Abe	US-DOE, USA, (<i>Host</i>)	abe_vanluik@notes.ymp.gov
VOINIS, Sylvie	OECD/NEA	sylvie.voinis@oecd.org
WONG Frank	US-DOE, USA	Frank_Wong@ymp.gov

2. Recently deceased.

The role of the Workshop Programme Committee is mainly to organise the workshop, and specifically, to:

- Define the format of the workshop and conditions of participation.
- Identify and describe the technical sessions and working groups to be convened.
- Identify chairpersons and rapporteurs for plenary and working group sessions.
- Suggest speakers and prepare the instructions for the authors.
- Review the proceedings.

7. PRACTICAL INFORMATION/ORGANISATION

The Workshop is an NEA-EC Workshop organised in the framework of the OECD Nuclear Energy Agency, Integration Group for the Safety Case – IGSC. US-DOE will host the Workshop at Las Vegas, USA on 14-17 September 2004. A technical tour to YUCCA MOUNTAIN site will be organised on 14 September 2004. A bus will pick up participants at the conference hotel at about 6:40 AM and bring them to a DOE facility in the city for a safety briefing. There, visitor badges will be issued, so passports will need to be shown. The bus will then proceed to Yucca Mountain for the tour, and will deliver participants back to the hotel in the late afternoon (before 5 PM). Federal regulations prohibit the Department from providing lunches, so lunches will be purchased for those who wish to have a lunch provided for them (most all participants do).

8. PARTICIPATION

The EBS Project is open to organisations of all NEA Member Countries active in the field of radioactive waste management, particularly with respect to disposal system design, assessment and optimisation. It is intended that, to a large extent, workshop attendees will come from, or represent, the IGSC member organisations.

Participation in the workshop will be limited to approximately 60 persons. Limiting the number of participants is necessary to ensure a workable size for the workshop and to allow sufficient leeway for the workshop organisers to invite specific experts and other speakers.

It is recognised that several different topic areas will be considered at the workshop.

Although participating organisations may nominate several representatives as “information providers”, in most cases, the organisations should plan on sending only one or at most two of these representatives to the workshop. Workshop attendees need to be suitably informed so as to be able to share on practical views as wide a range of topics within the broad subject area of “EBS process issues”.

All attendees are required to take active part in the discussions at the workshop and are encouraged to bring to the workshop relevant examples and materials (e.g., reports, software) from their disposal programme.

9. WORKING LANGUAGE

English will be the working language of the Workshop and the proceedings.

10. ORAL PRESENTATIONS

All workshop sessions, including the Working Groups, will be provided with a portable computer, equipped with Microsoft PowerPoint software, and a data projector.

Presenters are requested to provide an electronic version of their oral presentations in advance of the workshop in order to provide a CDROM of all presentations and available information at the workshop.

11. REPORTING

The workshop will be reported in a proceedings volume, which will comprise a synthesis of the presentations, discussions and findings of the workshop, and the written contributions from the Working Groups. The Programme Committee will review the proceedings before publication. A copy of the proceedings will be distributed free of cost to all workshop participants.

12. INSTRUCTIONS FOR AUTHORS

Authors are requested to structure their papers by following the four topics as described in chapter 3 and so that they address:

- Methodology
- Specific examples
- Issues and problems

Authors are requested to provide an electronic copy of their complete paper (at least 4 pages and maximum 10 pages) to the NEA Secretariat with a copy to the Workshop Programme Committee (e-mail addresses: see section 6 of the programme).

In order to facilitate publication of the Proceedings, authors are requested to follow the instructions presented in very carefully (*the submissions will be reproduced without editing or reformatting*) see ANNEX 2.

13. LOCAL ARRANGEMENTS

Workshop Location: Embassy Suites Hotel, 3600 Paradise Road, Las Vegas, Nevada 89109 (just a few miles from the airport).

Accommodation

Embassy Suites Hotel, 3600 Paradise Road, Las Vegas, Nevada 89109
Phone: +1-702-893-8000 or (In North America) +1-800-362-2779, Fax: +1-702-893-0378.
[<http://www.embassysuites.com/en/es/hotels/index.jhtml?ctyhocn=LASCCES>]

All rooms are 2-room suites. In-room Internet access is available for \$ 10 per day. A US Government negotiated rate of \$ 79 per room (spouse or significant other stays free) can only be obtained by phoning or faxing in you reservation, stipulating the “NEA Las Vegas Int’l Workshop.”

PARTICIPANTS NEED TO CALL OR EMAIL THE HOTEL INDIVIDUALLY to make their reservations, using the numbers given above. Because some participants will elect to stay at other hotels, only 45 rooms have been blocked at the conference hotel. If there are no rooms at the conference rate, please contact Abe Van Luik (abe_vanluik@ymp.gov, or 1-702-794-1424) and he will see if rooms can be added at the conference rate.

Coffee Breaks/Lunch

Breakfast is served by the hotel and is included in the room cost, coffee and light refreshments will be provided in the main meeting room. Decisions concerning lunches can be made individually or in groups, there is ample opportunity within a few miles of the meeting location to have lunch and return to the meetings on time. A group dinner will be planned for the evening of the 15th. The location has not yet been selected.

Transportation

The hotel/meeting location is just a few miles from the airport, and can be relatively inexpensively reached via taxi or inter-hotel vans (not free) at the airport.

14. REGISTRATION AND PARTICIPATION

A participation fee of **500 Euro** is requested from all attendees in order to cover:

- The cost of the consultant, David Bennett, GSL, who will be helping the NEA document the workshop, and in particular, drafting the workshop proceedings.
- Costs associated with the workshop that cannot be borne entirely by the host organization such as the diner of the 15th September 2004 and the lunch during the Yucca Mountain tour.

The registration fee should be paid in EURO by bank transfer to the following account:

For French participants

Bank:	<u>JP Morgan Chase Bank, Paris, France</u>
Account number:	30628-00001-0060908330294
IBAN:	FR76/3062/8000/00100/6090/8330/294
SWIFT/BIC:	CHASFRPP
Siret:	775 687 957 00016
References:	AEN/EBS Workshop Las Vegas

For participants except from France:

Bank	<u>JP Morgan, AG, Frankfurt, Germany</u>
Account number:	6161603441
BLZ:	50110800
SWIFT/BIC:	CHASDEFX
IBAN:	DE95501108006161603441
References:	AEN/EBS Workshop Las Vegas

Attention: For the Bank Transfer, please inform your bank to mention the following references: “**AEN/EBS Workshop Las Vegas**”

Alternatively the registration fee may be paid using a cheque made payable to “OECD” and sent to the attention of:

Sylvie Voinis
OECD/NEA
Radioactive Waste Management Division
12, Boulevard des Iles
F-92130 Issy-les-Moulineaux

Unfortunately, payments by credit card are not accepted.

15. SECRETARIAT AND CONTACTS

The NEA is responsible for the Scientific Secretariat of the workshop. All technical questions in relation to the workshop should be addressed to the scientific NEA Secretariat:

Sylvie Voinis [sylvie.voinis@oecd.org].

The NEA representative in practical matters (registrations) is:

Katia-Karina Le Bot [katia-karina.lebot@oecd.org].

The representative from the host organisation is:

Abe Van Luik [Abe_VanLuik@Notes.YMP.GOV].

Annex 1

AGENDA

1st day – 14 September 2004

VISIT OF THE YUCCA MOUNTAIN SITE

For those workshop participants will visit the Yucca Mountain Site on 14 September 2004, additional information will be sent separately regarding visitor badging and lunch choices.

06:40	Departure from Hotel to Yucca Mountain Science Center
07:00	Visitor Training and Badging at Yucca Mountain Science Center
07:45	Travel by Bus to Yucca Mountain
09:45	Presentations: current status of US-DOE Studies
10:15	Tour site and visit
14:30	Depart Yucca Mountain Site for Las Vegas
16:30	Arrive at Hotel / Possibility for Registration

2nd Day - 15 September 2004

PLENARY SESSION

Chairperson : Bob Mac Kinnon (SNL, USA)

Rapporteur: David Bennett (GSL, UK)

- 08:00** **Start of registration**
- 09:00** **Welcome Addresses**
A. Van Luik (US-DOE-YM, USA); S. Voinis (OECD/NEA); C. Davies (EC)
- 09:15** **Introduction to the EBS Project: Scope and Objectives of the Workshop**
H. Umeki, Chair of the Project; (NUMO, Japan)
- 09:20** **Overview of U.S. Department of Energy Yucca Mountain Repository Project, with Emphasis on Performance Assessment**
A. Van Luik (US-DOE-YM, USA)
- 09:40** **Overview of projects and activities related to EBS processes, carried out as part of the 5th and 6th EURATOM Framework Programmes (1998-2006)**
C. Davies (EC)
-
- 10:00** **Coffee Break**
-
- 10:20** **An approach to Analysing Potential Effects of Pre-closure Processes on Long-term Safety of a Geological Repository**
H. Umeki, H. Ueda and M. Naito (NUMO, Japan); H. Takase (Quintessa Ltd., Japan)
- 11:00** **The Swedish Safety Report SR-Can - Near-field Processes and Concepts during Repository Operation**
I. Puigdomenech (SKB, Sweden)
- 11:40** **Development of Thermal Criteria for a SF/HLW Repository in Opalinus Clay**
L. Johnson, P. Blümling, A. Gautschi and P. Wersin (Nagra, Switzerland)
-
- 12:20** **Lunch Break**
-
- 14:00** **Thermal Management and Analysis for a Yucca Mountain Repository**
R. MacKinnon (US-DOE-YM, USA)
- 14:40** **Alteration of Non-Metallic Barriers and Evolution of Solution Chemistry in Salt Formations in Germany**
H-J. Herbert, D. Becker, S. Hagemann, Th. Meyer, U. Nosec and, A. Rübél, (GRS, Germany); R. Mauk and J. Wollrath (BfS, Germany)

15:20 **Tea Break**

15:40 **Characterizing the Evolution of the In-drift Environment in a Yucca Mountain Repository**
A. Van Luik (US-DOE-YM, USA)

16: 20 **Radwaste disposal in France Radionuclides Behaviour through EBS for the disposal in the Callovo-Oxfordian clay formation: From Knowledge to Performance Assessment**
E. Giffaut and F. PLAS (Andra, France)

17:00 **Transport of Radionuclides in Spanish Performance Assessments**
J. Alonso, (Enresa, Spain)

17:40 **Discussion**

18:00 **Close and end of the day 2**

19:30 **Dinner at:**

Gordon Biersch Brewery Restaurant
3987 Paradise Road
Las Vegas, Nevada 89109
Phone: +1 702 312 5247

3rd day - 16 September 2004

WORKING GROUP SESSIONS

09:00 **Introduction of Working Groups Sessions**
D. Bennett (GSL, UK)

09:15-10:30 **Parallel Working Groups Sessions**

10:30-11:00 **Coffee Break**

11:00-12:30 **Parallel Working Groups Sessions (*cont'd*)**

12:30-14:00 **Lunch Break**

14:00-15:30 **Parallel Working Groups Sessions (*cont'd*)**

15:30-16:00 **Tea Break**

16:00-17:30 **Parallel Working Groups Sessions (*cont'd*)**

Details of the questions to be addressed by the Working Groups will be given within the final programme.

Annex 2

INSTRUCTION FOR AUTHORS

IMPORTANT REMARKS

Please be sure to use the WORD 97 in A4 format and using TIMES NEW ROMAN as the font, even for equations.

Please check the clarity of figures/pictures/equations once inserted in the text and printed in Black and white.

For figures, drawings, maps... encapsulated post-script files (.eps) or high-resolution (300 dpi) .tif files inserted as a PICTURE and (not as a FILE) in the text document are preferred.

If there is no electronic version of your figures/photos, leave the appropriate space in the text and provide a full-page, high-quality, original (with figure/photo number on the reverse side and indicating top and bottom). Do not tape or glue them to the paper.

DISPATCH

Please send to the address below: one original copy and one electronic copy of your paper along with the signed Grant of Publication Rights form (see attached). Material for publication cannot be accepted by fax.

Electronic copies may be provided on the following media formatted for PC: 3.5 inch high-density (1.44 MB) diskettes; floppy zip (100 MB); super disk (3.5", 120 MB); CD-ROM. Please label your media clearly. FTP transfers and e-mail are also possible.

Sylvie Voinis
OECD/Nuclear Energy Agency
12, Boulevard des Îles
F-92130 Issy-les-Moulineaux
Tel: +33 (0)1 45 24 10 49
Fax: +33 (0)1 45 24 11 45
E-mail: sylvie.voinis@oecd.org

[5 blank line font 11 or 60 pt]

Title [Bold, Centred, Times New Roman 11. First Letter in Each Word Should Be in Upper Case, except Prepositions and Articles]

[2 blank lines, font 11 or 36 pt]

Author [centred, Times New Roman 11, bold]

Affiliation, Country [Centred, Times New Roman 11]

[1 blank line, font 11 or 12 pt]

Second author [centred, Times New Roman 11, bold]

Affiliation, Country [Centred, Times New Roman 11]

[2 blank lines, font 11 or 24 pt]

Body text [Times New Roman 11, with any numbers and units joined by a forced blank. Margins: Top - 3.45 cm, Bottom - 3.45 cm, Left - 2.8 cm and Right - 2.2 cm, Header 1.0 cm, Footer for pagination 2.5 cm. A4 paper size for the page set-up even if you are printing on another size paper. Alignment: Justified, Line spacing: Single]

- 1. Subtitles [Bold, Times New Roman 11, with first letter of first word capitalised only]**
to be numbered as **1, 1.1, 1.1.1,**
Body text [see above]

Caption Table 1. [centered, Arial 9, bold, and placed above the table]

[1 blank line, font 11 or 12 pt]

Caption Figure 1. [centered, Arial 9, bold, and placed above the figure]

Figures: encapsulated post-script files (.eps) or high-resolution (300 dpi) .tif files inserted as a PICTURE and (not as a FILE) in the WORD document.

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References

[A consistent referencing system should be used throughout the paper, e.g. consecutive numbers, authors' names and date. All references should be collected together in a section headed "References" at the end of the paper. Please avoid using acronyms for designating publications.]