

International
Nuclear
Fuel
Cycle
Evaluation

X48007382

INFCE

INFCE/DEP/WG.4/18

RECORD OF THE SECOND MEETING OF SUB-GROUP B, VIENNA, APRIL 1978

International Nuclear Fuel Cycle Evaluation

INFCE/WG.4/27 (B)

3 April 1978

Working Group 4

Sub-Group B

INFCE WORKING GROUP 4, SUB-GROUP B: PLUTONIUM MANAGEMENT
AND RECYCLE

RECORD OF SECOND MEETING OF THE SUB-GROUP

VIENNA: 3 APRIL 1978

1. OPENING OF SESSION BY MR SHIGEFUMI TAMIYA
 - 1.1. Mr Tamiya opened the meeting and welcomed all delegates* on behalf of the United Kingdom and Japan.

2. OPENING REMARKS BY CO-CHAIRMEN
 - 2.1. Mr Tamiya noted that the main task of the meeting was to hear progress reports on contributions from participating countries and organisations. Many of the documents were first drafts and would no doubt be modified. Since there had been insufficient time for delegates to read the documents, substantive discussion on them would be deferred until the Tokyo meeting in May.
 - 2.2. Mr Buck noted that the Sub-Group was beginning to get papers from other Sub-Groups. Papers INFCE/WG.4/16(A) and 17(A) were papers produced for Sub-Group A and were tabled for information. In discussion at Sub-Group 4A further work on these papers had been requested and the papers would be re-issued in due course.

3. ADOPTION OF THE AGENDA
 - 3.1. The provisional agenda was adopted and is attached at Annex A.

* List of Delegates at Annex B

4. RECORD OF THE FIRST MEETING OF THE SUB-GROUP

- Paper INFCE/WG.4/14(B)

- 4.1. The meeting took note of the record of the first meeting held on 26 January 1978.
- 4.2. Arising from paragraph 5.4 of the record, the Indian delegate proposed that the reference to plutonium arising "from operation of civil (that is non-military) reactors" should be deleted. However, other delegates considered that this clarification would be helpful to any readers not directly involved in the work of the Sub-Group. The Technical Secretariat pointed out that the record could not be changed as it was a record of what had transpired. If change were required it was paragraph 5 of the note by the Co-Chairmen (INFCE WG.4/8 (B)Rev 1.) which should be amended.
- 4.3. It was agreed that neither the record nor the note by the Co-Chairmen should be amended but that in future the words "reactor" or "power reactor" rather than "civil reactor" or "civil power reactor" should be used.

5. PROGRESS REPORTS FROM THE JAPANESE/BRITISH TECHNICAL SECRETARIAT, CONTRIBUTING COUNTRIES AND ORGANISATIONS

Task 1: Collection of Basic Data

- Papers: INFCE/WG.4/15(B)
INFCE/WG.4/22(B)
Co-Chairmen/WG.4/5(B)
INFCE/WG.4/18(A,B)

- 5.1 The Technical Secretariat expressed appreciation for the replies received to the December questionnaire. The results had been collated so far as possible in the two INFCE papers listed above. Since replies varied widely in form and scope, it had not been possible to analyse all their contents in a systematic manner. For this reason copies of the full replies received were tabled for the information of delegates under cover of Co-Chairmen's paper WG.4/5(B), with certain replies received in the last few days tabled individually.

- 5.2. The main value of replies to the December questionnaire would be as an addition to the data sought by the somewhat more precise questionnaire which had been compiled as agreed at the last meeting of the Sub-Group. It had been prepared in collaboration with NEA and was tabled (INFCE WG.4/18(A,B)).
- 5.3. The new questionnaire was intended to cover the needs of both Sub-Groups A and B. It would be distributed by IAEA to all INFCE participants shortly. The Technical Secretariat was conscious that INFCE had generated a large number of questionnaires and thus had endeavoured not to cover ground which duplicated material being provided in response to questionnaires issued by other INFCE groups. Although the questionnaire provided for high, low and/or reference estimates, it was not intended that respondents should attempt to provide answers which could not reasonably be derived from existing national programmes and forecasts.
- 5.4. In response to questions the Technical Secretariat clarified the following points in the questionnaire:
- i. In Table 1.2, line A referred to cumulative spent fuel arisings, ie the amount of material discharged from reactors added up year by year; line C related to the amount of irradiated fuel actually in store at the end of the years specified, ie taking account of whether there had been reprocessing or not. The dates referred to were clarified as follows:

Columns 2 - 4 (lines A and B) referred to spent fuel arisings accumulated from the end of 1977 to 1985, columns 5 - 7 referred to spent fuel arisings accumulated from 1977 - 1990 etc.
 - ii. In relation to the projections of nuclear power capacity (Table from INFCE Group 1'/2A questionnaire annexed to Group 4 questionnaire), it was noted that only high and low cases were requested. Since

respondents submitting reference cases for the items in the Group 4 questionnaire would need to derive these from a reference case for their basic nuclear power programme, the Technical Secretariat would be glad to receive details of these power programme reference cases if participants were able to submit them.

- 5.5. It was agreed that participants should be requested to respond to the questionnaire by 1 May 1978 if possible, or by the beginning of the series of Working Group 4 meetings in Tokyo, ie 15 May 1978.

Task 2. Current methods of Plutonium Storage

- 5.6. FRG and France reported that their contributions to this task were not yet complete but would be ready for distribution in advance of the Tokyo meeting.
- 5.7. It was agreed that:
- i. the draft contributions to this task from FRG and France should be considered at the next meeting of the Sub-Group.
 - ii. The FRG report on small scale/short term storage should cover storage as plutonium nitrate in addition to plutonium oxide.

Task 3. Current methods of Plutonium Transport: Base Case

- Papers: Co-Chairmen/WG.4/6 (B)
Co-Chairmen/WG.4/2(B)

- 5.8. It was noted that there would be two basic contributions to this task:
- i. A joint UK/CEC paper on plutonium transport within the European Community (as outlined in Co-Chairmen's paper WG.4/6 (B)).
 - ii. A UK paper on plutonium transport on a global scale (as outlined in Co-Chairmen's paper WG.4/2(B)).
- These reports would be ready later in the year.

- 5.9. It was noted that the UK would contribute to Group 6 on the transport of irradiated fuel.
- 5.10. The US renewed its offer to contribute on technical alternatives for transport, ie to Task 5.

Task 7. Plutonium Recycle: Base Case

b) Definition of Reactor

- Paper: Co-Chairmen/WG.4/4(B)

- 5.11. The Japanese delegate introduced Co-Chairmen's paper WG.4/4(B). He explained that the first part of the paper was a summary of information. The second part contained the definition of the reactor following the guidance of Annex 7 of the Co-Chairmen's paper INFCE WG.4/8, Rev 1(B). It was agreed that since the Japanese paper had been tabled at the meeting and therefore most delegates had been unable to study it in detail, substantive discussion of it would be deferred until the meeting in Tokyo.
- 5.12. Italy, FRG and USA, who had expressed willingness to assist in Task 7 (b), indicated that they would examine the Japanese paper and provide additional contributions based on their own experience for discussion at the Tokyo meeting.
- 5.13. Delegates congratulated Japan on the comprehensive nature of their paper and in a short preliminary discussion the following points were made:
- i. The load factors and reactor mix estimates differed from those used by NEA/IAEA in their recent publication on uranium.* Possible adjustments would need to be considered to facilitate comparisons with this report and with the work of other INFCE Groups.
 - ii. In the context of evaluating Pu recycle it would be desirable to take account of later recycles and the equilibrium position.
 - iii. In future the phrase "once - through" cycle should be used instead of "throw-away" cycle.

* Uranium: Resources, Production and Demand. December 1977. Joint report by the OECD Nuclear Energy Agency and the IAEA.

c) Mixed Oxide Fuel Fabrication Facility

- Paper: Co-Chairmen/WG.4/1(B)

- 5.14. The delegate from Belgium introduced their draft contribution on this subject (Co-Chairmen's Paper WG.4/1(B)). Delegates congratulated Belgium on the excellence of this document. Since the paper had only just been received by most delegates it was agreed to defer substantive discussion on it to the Tokyo meeting.
- 5.15. FRG offered to submit a supplementary paper on the conversion of plutonium, since this was not covered in the Belgian draft, for discussion at the Tokyo meeting.
- 5.16. The US delegate drew attention to a paper presented by the US to Working Group 8 (INFCE WG.8 US Doc.2) which he thought contained factors which might be relevant to this and other studies. He was not proposing to submit this paper to Sub-Group 4B but would make copies available to participants on request.

d) Cost Data

- Paper: Co-Chairmen/WG.4/3(B)

- 5.17. The Technical Secretariat (Japan) introduced Co-Chairmen's paper WG.4/3(B). The paper consisted of a list of documents surveyed, the items covered and a table proposing cost data. A detailed report on cost data evaluation would be available for the Tokyo meeting.
- 5.18. It was noted that the references used were mainly US documents and it was suggested that other countries might wish to make contributions.
- 5.19. The IAEA delegate drew attention to cost data available from the IAEA study on Regional Fuel Cycle Centres.
- 5.20. The US delegate referred to two papers which he had presented to Sub-Group 4A entitled respectively "Economic Assessment Factors" and "Environmental Assessment Factors" (INFCE WG4/24(A) and 25(A)). These indicated additional assessment factors which he thought might be relevant to a full evaluation.

6. ANY OTHER BUSINESS

Numbering and Distribution of Papers

- 6.1. The Technical Secretariat reported the introduction of the Co-Chairmen's numbering series for documents not receiving full distribution. This is explained in Annex D.
- 6.2. It was noted that the distribution of papers through missions in Vienna was not working very well, since a number of delegates were not receiving papers when these reached their countries. It was also proving to be a slow mechanism. It was agreed that the Technical Secretariat would in future mail all documents direct to a nominated delegate in participating countries, in addition to distribution through Vienna missions.

International Management of Plutonium

- 6.3. At the request of the Co-Chairmen, the IAEA delegate reported that the Agency hoped to present a discussion paper on this subject by the date of the Working Group 4 meetings in Tokyo 15 - 19 May 1978.

Future Meetings

- 6.4. The Japanese delegation outlined arrangements for the meetings of Working Group 4 and the two Sub-Groups to be held in Tokyo in May. See Annex E.
- 6.5. It was agreed that the fourth meeting of the Sub-Group should take place in Vienna in the week of 16 - 22 September 1978. It was hoped that this week would be convenient for the fourth meeting of Sub Group A also. (see Annex C).

Vienna
3 April 1978

ANNEXES

- ANNEX A - Agenda as adopted
- ANNEX B - List of delegates
- ANNEX C - Dates of future meetings
- ANNEX D - Note on numbering of papers
- ANNEX E - Arrangements for May meetings in Tokyo
- ANNEX F - List of documents considered at
Second Meeting
- ANNEX C - Addresses of Technical Secretariat

International Nuclear Fuel Cycle Evaluation

INFCE

INFCE/WG.4/23 (B)
30 March 1978

ANNEX A

PROVISIONAL AGENDA FOR THE SECOND MEETING OF
INFCE WORKING GROUP 4, SUB-GROUP B
HELD 3-4 APRIL 1978, IAEA HEADQUARTERS, VIENNA
OPENING TIME : 9:30

1. Opening of session by Mr. Shigefumi TAMIYA
2. Opening remarks by Co-Chairmen:
 - Mr. Shigefumi TAMIYA (executive Director, Japan Nuclear Enrichment and Reprocessing Group)
 - Mr. Cyril BUCK (Director, British Nuclear Fuels Limited)
3. Adoption of the agenda
4. Record of the first meeting of the Sub-group:
To note INFCE/WG.4/14 (B)
5. Progress reports from the Japanese/British technical secretariat, contributing countries, and organizations:
 - (1) Task 1 - Collection of basic data
collation of replies to the December 1977 questionnaire
 - (2) Task 2 - Current method of Plutonium storage; base case
 - b) definition of Plutonium storage
 - (3) Task 3 - Current method of Plutonium transport; base case
 - a) Definition of transport
 - (4) Task 7 - Definition of base case,
 - b) Definition of reactor
 - c) Fuel fabrication facility
 - d) Cost data
6. Any other business

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Mr. S. Tamiya

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*) These participants are the Correspondents for the Sub-Group, all direct correspondence should be directed to them, for further distribution.

DATES OF FUTURE MEETINGS

Sub-Group 4A	15 May 1978, Tokyo, 14.30 hours
Sub-Group 4B	17 May 1978, Tokyo, 10.00 hours
Group 4	19 May 1978, Tokyo, 10.00 hours

The following dates are provisional:

Sub-Group 4A	18 September 1978, Vienna
Sub-Group 4B	20 September 1978, Vienna
Group 4	17 October 1978, London
Sub-Group 4A	23 January 1978, Vienna
Sub-Group 4B	26 January 1978, Vienna

NOTE ON NUMBERING OF PAPERS

The following system for numbering Working Group 4 documents has been introduced as explained in INFCE/SEC/3.

Co-Chairmen's Numbers

Co-Chairmen numbers are given to documents of a provisional nature. These documents are distributed to Working Group participants only. Co-Chairmen's papers are numbered in sequence and numbers indicate the Group or Sub-Group to which papers are circulated: for example, Co-Chairmen/WG.4/1 (A), Co-Chairmen/WG.4/2 (A,B) etc.

INFCE Numbers

INFCE numbers are given to documents of a more final nature. They are given a full INFCE distribution.

ARRANGEMENTS FOR MAY MEETINGS IN TOKYO

The Embassy of Japan presents its compliments to and, with reference to the Working Group 4 of the International Nuclear Fuel Cycle Evaluation (INFCE), has the honour to inform as follows:

1. At the first meetings of Sub-groups A and B of the Working Group 4, which were held in Vienna at the end of January, 1978, it was agreed that the third meetings of the two Sub-groups would be held in Tokyo on May 16 and 17, 1978 respectively and that the second of the Working Group 4 would be held also in Tokyo on May 18 and 19.

2. In view of the anticipated heavy workload of the two Sub-groups, however, the Japanese and British Co-Chairmen have recently decided to reschedule the Tokyo meetings as follows:

- | | | |
|----------------------|--------|---------------|
| (1) Sub-group A: | May 15 | 14:30 - 17:30 |
| | May 16 | 10:00 - 17:30 |
| (2) Sub-group B: | May 17 | 10:00 - 17:30 |
| | May 18 | 10:00 - 12:30 |
| (3) Working Group 4: | May 19 | 10:00 - 17:30 |

3. All the meetings will be held in the International Conference Room on the 7th floor of the Ministry of Foreign Affairs (1-2-2, Kasumigaseki, Chiyoda-ku, Tokyo).

4. The provisional agenda of these meetings will be prepared by the Co-Chairmen in due course and distributed to all participants prior to the meetings.

5. As these meetings happen to be in the busiest tourist season in Japan and coincide with the Rotary International 1978 Tokyo Convention which will be held during the same week with the participation of an unusually large number of guests from abroad, it is feared that hotel reservation in Tokyo will be extremely difficult to make. Therefore, it is strongly recommended that delegates who plan to attend the meeting make their hotel reservations as early as possible through their travel agents or their embassies in Tokyo.

For those delegates who cannot possibly make reservations, the Japanese Ministry of Foreign Affairs has reserved 50 single rooms at the Tokyo Sunny Side Hotel which is about 30 minutes by subway from the Ministry.

Therefore, if those delegates need the help of the Ministry, they should notify the Embassy of Japan of their names and dates of their arrival and departure as soon as possible, not later than April 20.

6. A special one-day excursion to Tokai Mura, about 130 km from Tokyo, is scheduled on May 20 for interested participants to visit the Tokai reprocessing and other facilities.

Those delegates who wish to join this excursion are kindly requested to notify the Embassy of Japan of their names (or if not possible, the number of those who wish to join the excursion) before April 15, in order to enable the host government to make necessary preparations.

LIST OF DOCUMENTS CONSIDERED/TABLED AT WORKING GROUP 4,
SUB-GROUP B MEETING ON 3 APRIL 1978

INFCE Papers

INFCE/WG.4/14 (B) 30 January 1978	Record of the first meeting of Sub-Group B, 26 January 1978
INFCE/WG.4/15 (B) 16 March 1978	Interim report on questionnaire
INFCE/WG.4/16 (A,B) 16 March 1978	The occurrence of plutonium at different points in the fuel cycle
INFCE/WG.4/17 (A,B) 16 March 1978	Regional differences in energy supplies utilising uranium resources in various fuel cycles
INFCE/WG.4/18 (A,B) 21 March 1978	Questionnaire issued by the Co-Chairmen
INFCE/WG.4/22 (B) 31 March 1978	Present status and future programme of reprocessing, Pu handling and recycle
INFCE/WG.4/23 (B) 30 March 1978	Provisional agenda for the second meeting of INFCE Working Group 4, Sub-Group B

Co-Chairmen's Papers

Co-Chairmen/WG.4/1 (B) 9 February 1978	Mixed oxide fuel fabrication
Co-Chairmen/WG.4/1 Add 1 (B)	Mixed Oxide fuel fabrication facility (summary)
Co-Chairmen/WG.4/2 (B) 30 March 1978	Task 3 Current methods of transport of plutonium, progress report on UK experience
Co-Chairmen/WG.4/3 (B) 22 March 1978	Task 7 Definition of the base case: (d) cost data
Co-Chairmen/WG.4/4 (B) 20 March 1978	Task 7 Definition of the base case: (b) definition of reactor
Co-Chairmen/WG.4/5 (B) 31 March 1978	Answers to December questionnaire

Co-Chairmen/WG.4/5 Add 1
(B)

Additional answers from FRG,
Netherlands, Romania and Switzerland

Co-Chairmen/WG.4/6 (B)
3 April 1978

Task 3 **Current methods of plutonium**
transport, progress report from the CEC

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