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INFCE

International
Nuclear
Fuel
Cycle
Evaluation

INFCE/DEP/HC.4/17

RECORD OF THE FIRST MEETING OF SUB-GROUP B, VIENNA, 26-27 JANUARY 1973

International Nuclear Fuel Cycle Evaluation

INFCE/WG.4/14(B)

30 January 1978

Working Group 4

Sub-Group B

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

RECORD OF FIRST MEETING OF THE SUB-GROUP

VIENNA: 26 JANUARY, 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 reminded the Sub-Group that its terms of reference were those remitted by the full Working Group meeting in London, 6-7 December 1977. The work of the Sub-Group should be carried out in the spirit of the final communiqué of the Organising Conference of INFCE. He hoped that the countries and organisations represented would be willing to make substantial contributions to the work of the Sub-Group. As UK Co-Chairman Mr Buck endorsed Mr Tamiya's points and emphasised that both the Government and the nuclear industry in the UK recognised the importance of INFCE.

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. ORGANISATIONAL ARRANGEMENTS
- Paper INFCE/WG.4/7(B)

- 4.1. The Co-Chairmen introduced their paper. They indicated that they were establishing a joint Japanese/British technical secretariat for the Sub-Group. The Technical Secretariat would be under the joint direction of Mr Kunihiko Uematsu of Japan and Mr Michael James of the UK.*
- 4.2. All papers for the Sub-Group should be sent in duplicate to the Japanese Resident Representative to IAEA. IAEA would then be responsible for their numbering and distribution through Missions in Vienna. In cases of exceptional urgency papers could be sent in addition direct to both the Japanese and British Technical Secretaries. It was agreed that the headings of working documents should make clear their status: for example whether they represented an agreed Sub-Group paper or the contribution of a particular country or organisation.
- 4.3. Records of Meetings would be circulated as soon as possible after each meeting, following their agreement by the Co-Chairmen. Delegates wishing to raise any point of substance on Records should do so at the next meeting of the Sub-Group.
- 4.4. Dates of future meetings were agreed as in Annex C.
- 4.5. It was noted that the IAEA Secretariat would be issuing a paper explaining the numbering of INFCE documents generally. A list of Working Group 4 papers issued to date is at Annex D.

* Addresses of Technical Secretariat at Annex G

5. PRESENTATION OF NOTE BY THE CO-CHAIRMEN

- Paper INFCE/WG.4/8(B)

- 5.1. The Co-Chairmen introduced their paper setting out the main tasks of the Group.

PLUTONIUM MANAGEMENT

Task 1: Collection of Basic Data

- 5.2. A number of delegates said their countries had found difficulties with the questionnaire* annexed to the Working Group paper circulated after the first Group 4 meeting on 6-7 December 1977. It was also pointed out that the information requested appeared to overlap (for OECD countries) with information they had supplied for the NEA Study on Reprocessing. Could not that document provide the necessary basic data? It also appeared that a supplementary questionnaire would be required to obtain other information needed for the work of the Sub-Group, which would not be derived from either the first questionnaire or the NEA Report.
- 5.3. It was agreed that:
- i. participants should return the questionnaire annexed to the Working Group paper agreed on 6-7 December 1977 (to be known as the "December 1977 questionnaire") within three weeks. Where appropriate, replies might be made by referring to NEA or other published sources;
 - ii. since the NEA Report on Reprocessing would be of great value to the Sub-Group it should be circulated as a Sub-Group paper;
 - iii. the Technical Secretariat would prepare a second questionnaire to supplement the December 1977 questionnaire (this would be known as the "February 1978 questionnaire") and would circulate it to participants for completion;

* Attached as Annex E

- iv. completion of both questionnaires should be sought from all INFCE participants, not only those in membership of Working Group 4;
- v. the Technical Secretariat would collate replies to the questionnaires and prepare a report, based on both replies and other published data;
- vi. the Note by the Co-Chairmen would be amended in the light of the discussion recorded in paragraph 5.2.

Task 2: Current Methods of Plutonium Storage: Base Case

- 5.4. It was proposed that the Co-Chairmen's paper should make it clear that all Tasks concerned with Plutonium Management should deal with plutonium arising from the operation of civil (that is non-military) reactors. Studies should take account of work by other INFCE groups bearing on plutonium arisings and be conducted in the context of a closed fuel cycle, distinguishing where appropriate between recycle in thermal or fast reactors.
- 5.5. It was noted that plutonium storage should be considered at two levels: short term or small scale storage and long term or large scale storage.
- 5.6. It was agreed that:
 - i. since Working Group 6 had already issued a questionnaire concerning present stocks of irradiated fuel, which would provide a basis from which present stocks of plutonium held in irradiated fuel might be derived, the Technical Secretariat should coordinate with Working Group 6: in order to use relevant data derived from the Group 6 questionnaire and avoid duplication of questions in Working Group 4 questionnaires;
 - ii. France would study long term/large scale storage and report to the Sub-Group;

- iii. the Federal Republic of Germany would study short term/small scale storage and report to the Sub-Group;
- iv. an amendment to the Note by the Co-Chairmen, to reflect the discussion recorded in paragraphs 5.4 - 5.5, was agreed.

5.7. The Co-Chairmen drew attention to the fact that Annexes 2-9 of their Note were intended as broad guidelines for input to Task 2 and subsequent Tasks, not as definitive outlines of studies.

Task 3: Current Methods of Plutonium Transport: Base Case

- 5.8. It was agreed that:
- i. the UK would prepare a study on the base case;
 - ii. the Commission of the European Communities (CEC) would also contribute material to this Task.

Tasks 4 + 5: Plutonium Storage: Technological Alternatives
Plutonium Transport: Technological Alternatives

- 5.9. It was noted that there would be a need for coordination between studies on these two Tasks. The Co-Chairmen invited all participants to be considering possible approaches to these Tasks, though work on them should be deferred until Tasks 2 and 3 had been completed. It was hoped that work might begin in September.
- 5.10. The US indicated willingness to contribute to both Tasks in due course.
- 5.11. It was noted that the possible technological alternatives mentioned under Tasks 4 and 5 in the Note by the Co-Chairmen were no more than examples for illustrative purposes and were not intended to limit the scope of future work.

5.12. Following discussion, it was agreed that in paragraphs 10 and 11 of the Note by the Co-Chairmen the words "which might increase the degree of proliferation resistance" should be deleted and replaced by "which respond to the intentions of the final communiqué of the Organising Conference of INFCE".

Task 6: Alternative Institutional Arrangements

5.13. (a) International Management of Plutonium.

The Co-Chairmen invited the IAEA, as in paragraph 12 of the Co-Chairmen's Note, to:

- i. submit their study on International Management of Plutonium to the Sub-Group;
- ii. continue their study in consultation with interested states;
- iii. take part in consideration of this subject by the Sub-Group.

The IAEA delegate said that he could accept these invitations in principle, subject to the approval of the Director General. He hoped that the IAEA could present their discussion paper on the International Management of Plutonium to the May meetings of Working Group 4 and Sub-Group 4B respectively.

5.14. The delegates of Argentina and India raised objections to the reference to Article XIIa5 of the Statute of the IAEA in paragraph 12 of the Note by the Co-Chairmen, expressing concern about the compulsory provisions of this Article and possible financial implications of its implementation. It was pointed out by other delegations that the reference was not intended to limit consideration of International Plutonium Management within the Sub-Group, but simply described the study being carried out by the Agency: which was in fact about possible ways of implementing Article XIIa5 of the Statute.

The Article had of course been in the Statute for twenty years. However, to avoid any possible misunderstanding that the work of the Sub-Group should be confined by Article XIIa5 of the Statute, a revised paragraph 12 was considered and agreed.

5.15. It was agreed that:

- i. the Note by the Co-Chairmen would be amended accordingly;
- ii. subject to the approval of the Director General, the IAEA would present their study on the International Management of Plutonium to the May meetings of Working Group 4 and Sub-Group B;
- iii. subject to the approval of the Director General, the IAEA accepted the invitation of the Sub-Group to continue their work on International Management of Plutonium.

5.16. (b) Plutonium Management with Improved Safeguards.

The IAEA delegate, while noting the request in paragraph 13 of the Note by the Co-Chairmen, asked for clarification on the extent and nature of the studies required. Pending such clarification, he could not make any commitment on behalf of IAEA at this stage, but the Agency would consider what useful contribution might be made. It was noted that all participants in the Group were welcome to contribute on this subject if they wished.

5.17. (c) Any Other Institutional Alternatives.

Contributions were invited from all participants including the IAEA. It was noted that institutional alternatives might include systems of plutonium management on a regional basis (for example within the European Community).

- 5.18. The Japanese delegation indicated that they would be making a contribution to this Sub-Task 6c.

PLUTONIUM RECYCLE

- 5.19. It was agreed that:

as proposed in the Note by the Co-Chairmen, the Sub-Group should concentrate on plutonium with uranium recycle, since this was of most general interest.

It was noted that the recycle of plutonium with uranium included both uranium separated from spent fuel and other uranium.

Task 7: Definition of the Base Case

- 5.20 It was noted that while the base case should be a light water reactor, no decision had yet been taken as to what type of light water reactor. An early decision on this point would be desirable.
- 5.21. It was agreed that:
- i. the Technical Secretariat would prepare a study on Task 7a: National Plans for Recycle;
 - ii. Japan would prepare a study on Task 7b: Definition of Reactor, which would take account of contributions volunteered by Italy and the US;
 - iii. Belgium would prepare a study on Task 7c: Definition of Fuel Fabrication Facility, taking account of a contribution volunteered by the US;
 - iv. the Technical Secretariat would prepare a study on Task 7d: Cost Data, taking into account contributions by Italy and the US.

- 5.22. The Federal Republic of Germany indicated that they would contribute to various aspects of Task 7.

Task 8: Assessment of Base Case

- 5.23. It was agreed that the "base case" should refer to existing technology of the complete fuel cycle including storage, fabrication, transport and performance in thermal reactors. The Note by the Co-Chairmen was amended to this effect.
- 5.24. It was agreed that:
Japan would take the lead in this Task with the help of the Federal Republic of Germany who would provide information on plutonium recycle especially with regard to performance in thermal reactors. The US and Italy would also contribute.
- 5.25. It was noted that the US GESMO Study would be relevant to this Task, as would a Safeguards supplement to this report which would be published shortly. The US agreed that they would make these available to the Japanese.

Task 9: Plutonium Recycle: Reactor Alternatives

- 5.26. It was agreed that there should be a new Task 9 on Plutonium Recycle which would cover reactor alternatives. Canada agreed to contribute work on plutonium recycle in a heavy water reactor.

Task 10: Plutonium Recycle: Technological and Institutional Alternatives

- 5.27. It was agreed that there should be a new Task 10 on Plutonium Recycle: Technological and Institutional Alternatives. This Task would cover alternatives which might arise from studies on plutonium management carried out by the Sub-Group. This Task would be assigned later.

Task 11: Plutonium Recycle: Reprocessing Alternatives

- 5.28. This Task (previously Task 9) would be assigned later in the light of work arising from Sub-Group 4A.

6. TIMETABLE OF MEETINGS OF SUB-GROUP AND SCHEDULE OF WORK
 - 6.1. This is attached at Annex F, which also summarises the assignment of work by contributing countries and organisations, and the Technical Secretariat, as indicated in Section 5 above.

7. REVISION OF NOTE BY CO-CHAIRMEN
 - 7.1. The Note by the Co-Chairmen, as revised in the light of the conclusions of the Meeting, would be circulated as a Sub-Group paper (INFCE/WG.4/8/Rev.1(B)).

Vienna

27 January 1978

LIST OF ANNEXES

ANNEX A - AGENDA AS ADOPTED

ANNEX B - LIST OF DELEGATES

ANNEX C - DATES OF FUTURE MEETINGS

ANNEX D - LIST OF ALL DOCUMENTS ISSUED BY WORKING GROUP 4
TO DATE

ANNEX E - DECEMBER 1977 QUESTIONNAIRE
(Originally circulated 6-7 December Meeting
of Working Group 4)

ANNEX F - TIMETABLE OF MEETINGS, SCHEDULE OF WORK,
ALLOCATION OF TASKS

ANNEX G - ADDRESSES OF TECHNICAL SECRETARIAT

International Nuclear Fuel Cycle Evaluation

INFCE

INFCE/WG.4/5/Rev. 1 (B)

25 January 1978

ANNEX A

Working Group 4

Sub-group B

PROVISIONAL AGENDA FOR INFCE WORKING GROUP 4 SUB-GROUP B MEETING¹

26-27 January, 1978

Vienna

1. Opening of session by Mr. Shigefumi Tamiya
2. Opening Remarks by Co-Chairmen

Mr. Shigefumi Tamiya (Executive Director, Japan Nuclear
Enrichment & Reprocessing Group)

Mr. Cyril Buck (Director, British Nuclear Fuels
Limited)

3. Adoption of the Agenda
4. Organisational arrangements
5. Presentation of Note by the Co-Chairmen:

consideration of the Sub-Group's tasks - (a) Plutonium Management
(b) Plutonium recycle

6. Assignment of work to be done by
 - (a) contributing countries and organisations
 - (b) Japanese/British secretariat

¹ Meeting begins 9.30 a.m., Room A, IAEA Headquarters

7. Timetable of Meetings of Sub-Group and Schedule of Work

8. Any other business

Division of External Relations
Conference Services Section

INFCE
Date 1978-01-26

Issue No. 2

NOTIFICATION OF A MEETING HELD AT HEADQUARTERS

Title of meeting: International Nuclear Fuel Cycle Evaluation (INFCE)
WORKING GROUP 4 on Reprocessing, plutonium handling,
recycle

Sub-group B on Plutonium

Dates, inclusive: 26-27 January 1978

Place: IAEA Headquarters, Room A Ext. 710

Enquiries: Conference
Co-ordination
Unit
Ext. 255/312

Note: Names of participants are shown in alphabetical order within the delegation.
Delegation leader is underlined.

Co-chairmen:

Japan
U.K.

Mr. Shigefumi Tamiya
Mr. C. Buck

ARGENTINA

Mr. R. Estrada-Oyuera

AUSTRALIA

Mr. N.R. McDonald

BELGIUM

Mr. J.- P. Leblanc

CANADA

Mr. J.B. Slater

GERMANY, FED.REP.

Mr. W. Boulanger

Mr. D. Hanus

Mr. H. Maßkl

Mr. W. von Osten

FRANCE

Mr. J.P. Regnier

Mr. R.A.R. Villard

INDIA

Mr. A. N. Prasad

Mr. M.V. Ramaniah

ITALY

Mr. B. Zaffiro

Mr. M. Zifferero

JAPAN

Mr. M. Hirata

Mr. K. Kaneko

Mr. K. Kato

Mr. S. Sato

Mr. S. Tamiya

Mr. K. Uematsu

MEXICO

Mr. J. Gonzalez-Romo

NETHERLANDS

Mr. P.J. Van der Hulst

PAKISTAN

Mr. M.N. Saied

PHILIPPINES

Ms. R.Q. Santayana

ROMANIA

Mr. M. Buhoară

SPAIN

Mr. E. Lopez-Menchero

SWITZERLAND

Mr. J. Peter

* (Turkey - see entry below)

U.K.

Mr. C. Buck

Mr. A. Higson

Mr. M.L. James

Ms. G.A. Smith

Ms. M. Stanley

Mr. D.E.J. Thornton

U.S.A.

Mr. G.R. Bray

Mr. L.C. Hebel

Mr. H. Lewenberg

CEC

Mr. N. Cadelli

OECD/NEA

Mr. S. Mankin

IAEA

Mr. J.E. Lovett

Mr. A. Pushkov

Mr. R. Rainer

OBSERVER

USSR

Mr. S. Ermakov

* TURKEY

Mr. N. Birsen

FUTURE MEETINGS

Sub-Group A	30-31 March, 1978, Vienna 9.30 am start
Sub-Group B	3-4 April, Vienna
Co-Chairmen's Meeting	15 May, Tokyo
Sub-Group A	16 May, Tokyo
Sub-Group B	17 May, Tokyo
Whole Group A	18-19 May, Tokyo

INFCE/WG.4/1	Agenda for first meeting 6-7 Dec 77)))	(Attached without numbers to letter Japan 26 Nov 77 and numbered retroactively
2	Working paper for first meeting))	
3	Record of first meeting (Report to TCC))	
4(A)	Provisional agenda for sub-group A (23-24 Jan 78)		20 Jan 78
5(B)	Provisional agenda for sub-group B (26-27 Jan 78)		20 Jan 78
5/Rev.1(B)	"		25 Jan 78
6(A)	Note by Co-chairmen for sub-group A		20 Jan 78
7(B)	Organisational arrangements of sub-group B		20 Jan 78
8(B)	Note by Co-chairmen for sub-group B		20 Jan 78
8/Rev.1(B)	Revised Note by Co-chairmen for sub- group B		30 Jan 78
9(A)*	Organisational arrangements of sub-group A		23 Jan 78
10(A)**	Reprocessing and plutonium facilities		23 Jan 78
11(A)***	NEA document No.1 for sub-group A - NEA Report on "Reprocessing of Spent Nuclear Fuels in OECD Countries"		
12(A)***	NEA document No.2 for sub-group A - Extract from NEA Report "Nuclear Fuel Cycle Requirements and Supply Con- siderations through the Long-Term"		
13(A)	Record of first meeting of INFCE Working Group 4, sub-group A 23 January 1978		30 Jan 78
14(B)	Record of first meeting of INFCE Working Group 4, sub-group B 26 January 1978		30 Jan 78

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- *) Originally numbered INFCE/4A/2
 **) Originally numbered INFCE/WG.4/SG.A/7
 ***) Did not bear an INFCE symbol when distributed in
 sub-group A, but was allotted a number in the INFCE
 series retroactively for reference purposes.

QuestionnairePresent Status and Future Program of
Reprocessing, Pu Handling and Recycle

1. Reprocessing
 - Needs
 - Present Status
 - Program
 - Outline of plants
 - Chemical forms of products
 - Storage of products
 - Pu production
2. Conversion
 - Needs
 - Present status
 - Program
 - Outline of plants
 - Chemical forms of products
 - Storage of products
3. Fabrication
 - Need
 - Present status
 - Program
 - Outline of plants

* Extract from Working Paper circulated at London Meeting, 6-7 Dec., 1977.

4. Recycle

Present status

Long term program

(including reactor type, mode of Pu loading,
time schedule and amount of Pu required)

Handling amount of Pu fuels

5. Transportation of Pu

Present status

Long term forecast

(including transportation route distance,
mode, amount)

Related information such as programs of nuclear power generation, including Fast Breeder Reactors refining and enrichment should be given to this group through other working groups.

TIMETABLE OF MEETINGS AND SCHEDULE OF WORK (SUB-GROUP B)

TASKS	SUB-TASKS	MEETING SCHEDULE 1978												TASK ASSIGNMENT AND CONTRIBUTIONS (lead countries/organisations underlined)
		Jan Vienna 26-27	Feb	Mar	Apr Vienna 3-4	May Tokyo 17	Jun Vienna (T.C.C.) 12	Jul	Aug	Sep (Sub- Group)	Oct (Group 4)	Nov (Plenary) (T.C.C.)	Dec	
1. Collection of Basic Data	Questionnaire (Dec. 1977)	Collection & Collation of replies ●-----▲-----○												Technical Secretariat (T.S.)
2. Current Method of Pu Storage, Base Case	(a) Questionnaire (Feb. 1978)	Collection & Collation of replies ●-----▲-----○												T.S. FRG (short term/small scale storage) France (long term/large scale storage) FRG (short term/small scale storage) France (long term/large scale storage) T.S. Assignment to be made later
	(b) Definition of Storage	●-----▲-----○ Define the storage												
	(c) Evaluation	●-----▲-----○ Economic, Environmental, Technological & Safety Aspects												
	(d) Proliferation Resistance	●-----▲-----○ Degree of Resistance ●-----▲-----○												
3. Current Method of Pu Transport, Base Case	(a) Definition of Transport	●-----▲-----○ Define the Transportation												UK, CEC UK, CEC Assignment to be made later
	(b) Evaluation	●-----▲-----○ Economic, Environmental, Technological & Safety Aspects												
	(c) Proliferation Resistance	●-----▲-----○ Degree of Resistance ●-----▲-----○												

● Initiation of Work

▲ Progress Report Made

○ Report Made

TASKS	SUB-TASKS	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec												TASK ASSIGNMENT AND CONTRIBUTIONS (lead countries/organizations underlined)	
		26-27 Vienna			3-4 Vienna	17 Tokyo	12 Vienna (T.C.C.)				(Sub-Group)	(Group 4)	(Plenary) (T.C.C.)		
4. Pu Storage, Technological Alternatives						●	-----						▲		Assignment to be made later } Assignment to be made later } US contribution offered
5. Pu Transport, Technological Alternatives						●	-----						▲		
6. Alternative Institutional Arrangements	(a) International Management	●	-----		▲								▲		IAEA
	(b) Improved Safeguards					●	-----						▲		IAEA
	(c) Other Arrangements					●	-----						▲		IAEA, <u>Japan</u>
7. Definition of Base Case, Pu Recycle	(a) Questionnaire (Feb. 1978)						Collection & Collation of Replies								T.S.
	(b) Definition of Reactor	●	-----		▲		Define the Reactor								<u>Japan</u> , Italy, USA, FRG
	(c) Fuel Fabrication Facility	●	-----		▲		Define the Fuel Fabrication Facility								<u>Belgium</u> , USA FRG
	(d) Cost Data	●	-----		▲		Collection of data & collation of Comments								T.S., USA, FRG, Italy
8. Assessment of Base Case, Pu Recycle						●	-----						▲		<u>Japan</u> , FRG, USA, Italy, Belgium
9. Pu Recycle Reactor Alternatives						●	-----						▲		Canada

● Initiation of Work

▲ Progress Report Made

○ Report Made

TASKS	SUB-TASKS													TASK ASSIGNMENT OR CONTRIBUTIONS (lead countries/organizations under ...)			
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
		26-27 Vienna			3-4 Vienna	Tokyo	17 (Vienna I.C.C.)	12				(Sub- Group)	(Group 4)	(Plenary) I.C.C.			
10. Pu Technological and Institutional Alternatives								●	Preparation for Task 10				●	Evaluation of Recycle			Assignment to be made later
11. Pu Recycle Reprocessing Alternatives								●	Preparation for Task 11								Assignment to be made later

● Initiation of Work

△ Progress Report Made

○ Report Made

JOINT DIRECTORS OF TECHNICAL SECRETARIAT

JAPAN

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