

COMMISSION OF THE EUROPEAN COMMUNITIES

COM(78) 683 final.

Brussels, 11 December 1978.

COMMUNITY EXTERNAL RELATIONS IN RESEARCH AND DEVELOPMENT MATTERS

(submitted to the Council by the Commission)

COM(78) 683 final.

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COMMUNICATION FROM THE COMMISSION TO THE COUNCIL

1. On June 24 and on July 6, 1976, an agreement in the form of an exchange of letters was concluded between the European Atomic Energy Community (Euratom) and the European Economic Community on the one hand and the International Energy Agency (IEA) on the other relating to co-operation in the field of Energy Research and Development.

According to the exchange of letters, the European Communities indicated their intention to negotiate, on a case by case basis, their participation in such "Implementing Agreements" prepared within the framework of the IEA as would contribute to the attainment of the research and development objectives of the Community. For its part, the IEA took note of this intention and confirmed that such participation is open to the European Community.

In application of this agreement, there has been concluded :

- an Implementing Agreement on the technical exchange of information in the field of reactor safety research and development;
 - an Implementing Agreement for a co-operative research and development programme leading to the construction of an intense neutron source;
 - an Implementing Agreement for a programme to develop and test solar heating and cooling systems;
 - an Implementing Agreement for a programme of research and development on the production of hydrogen from water;
 - an Implementing Agreement for a programme of research and development on plasma wall interaction in textor;
 - an Implementing Agreement for a programme of research and development on superconducting magnets for fusion power.
2. Implementing Agreements are "umbrella agreements" setting forth rules for the execution of a number of R & D "tasks" described in the annexes to each of the said Agreements. When signing any Implementing Agreement, Article 2 (a) specifies that each contracting party shall have to confirm its intention to participate in one or more of the tasks proposed under the Agreement.
 3. As mentioned above, the Commission has already signed the Implementing Agreement for a programme of R & D on the production of hydrogen from water and participates in the first three tasks of this Agreement. These are :

- Annex I : Chemical Engineering evaluations of thermochemical processes;
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Annex II : High Temperature Reactor (HTR) - Thermochemical Plant (TCP) Interface;

Annex III : Assessment of potential future markets for the production of Hydrogen from water.

In the attached document the Council will find two additional tasks (referred to as Annexes IV and V) of the Agreement which are proposed by the Executive Committee of the Implementing Agreement for signature by the Community. These are :

- a) Advanced Alkaline and Solid Polymer Water Electrolysis Development (Annex IV);
- b) Solid Oxide Water Vapour Electolysis (Annex V).

4. The Commission considers a Community participation in Annexes IV and V is justified for the following reasons.

Within the programme of R & D in Hydrogen use and production those aspects dealing with electrolysis are an important element in the Community's search for new energy technologies. Both Annexes IV and V of the IEA project are similarly concerned with research in alkaline and high temperature electrolysis which not only complements that being done in the Community's own programme but also makes available a whole range of additional research material useful in furthering the research objectives of the Community. Furthermore, in Annex IV, the work being done in Solid Polymer Electrolyte (SPE) electrolysis will considerably complement the more limited programme of the Community in this field.

5. As concerns those aspects dealing with information and intellectual property, the Commission considers that the provisions agreed in both Annexes IV and V are acceptable. In effect they provide that for information arising from the co-operation envisaged in these annexes, nationals from all Member States, as a result of the Commission's participation, will be entitled to obtain such licences for inventions and proprietary information. However, as concerns pre-existing information and in order to ensure a balance between benefits and obligations, nationals of non participating Member States of the Community will only be able to obtain pre-existing information on the condition that they are also prepared to exchange their own pre-existing information, a condition which has been agreed for all participants to the annexes, including those Member States of the Community who participate in their own right.

Finally it has been recognized that the Commission's purpose in participating in these annexes is undertaken in order to benefit the Community as a whole and is unrelated to any particular benefits acquired by individual Member States of the Community who make their own direct contribution to these annexes.

6. As concerns financial aspects, the participants contribution for each Annex is in the form of a "task", the cost of which will be borne by the participants themselves. The Commission proposes to contribute in each case the relevant aspects of research being carried out largely under contract for the Commission in the framework of the programme for R & D in Hydrogen use and production (indirect action). There will, however, be a small contribution from the Joint Research Centre's own R & D programme. The total cost of the research to be introduced as a contribution by the Community is estimated as about 2,582,000 EUA for Annex IV and 309,000 EUA for Annex V of which the Commission will pay 55 % and 50 % respectively.

The contractors involved in the Community's participation have given their approval to the Commission's participation.

7. As the Commission already indicated at the conclusion of the Implementing Agreement for a programme to develop and test Solar Heating and Cooling Systems⁽¹⁾, the Commission said that before signing similar kinds of Agreements it would inform the Council of its intention to sign such an Agreement and take note of any comments that the Council may wish to make.
8. In conclusion the Commission informs the Council of its intention to participate in the two additional tasks, referred to as Annexes IV and V which are specified for the Implementing Agreement for a programme of R & D in the production of Hydrogen from Water.

(1) Council Decision 18 July 1977 (R/1615/77 ATQ 62).

ANNEX IV

ADVANCED ALKALINE AND SOLID POLYMER WATER
ELECTROLYSIS DEVELOPMENT

1. OBJECTIVES

(a) Advanced Alkaline Water Electrolysis Development.

The objective of the work to be carried out in this area is to perform basic and applied research to be used by Participants for the development of advanced alkaline electrolysis plants.

(b) Solid Polymer Electrolyte (SPE) Water Electrolysis Development.

The objective of the work to be carried out in this area is to develop basic technology elements such as materials, electrocatalysis and electrolyte materials and to evaluate their performance for extended periods of time under large scale industrial conditions. As a result of the SPE development programme a demonstration module will be designed, developed and tested to meet some specified requirements.

2. MEANS

(a) Advanced Alkaline Water Electrolysis Development.

Each Participant will, in accordance with the following Table, be responsible for carrying out one or more of the Sub-Tasks indicated below:-

- (1) Selection and evaluation of separator materials for high temperature operation (100-200°C);
- (2) Long-term testing of selected separator materials in large-scale equipment;
- (3) Selection and evaluation of electrocatalysts for the Hydrogen and Oxygen Electrode Reactions;
- (4) Long-term testing of selected electrocatalysts in commercial equipment;
- (5) Selection and evaluation of electrode materials and current collectors;
- (6) Selection and evaluation of structural materials;
- (7) Investigations on cell gas and fluid dynamics;
- (8) Optimization of gas-liquid separators.

An overview of the participation in this task is presented in Table I.

TABLE 1

ADVANCED ALKALINE WATER ELECTROLYSIS DEVELOPMENT

C O U N T R I E S

TASK TITLES	C O U N T R I E S								
	BELGIUM	CANADA	F. E. C.	ITALY	JAPAN	NETHERLANDS	SWITZERLAND	UNITED KINGDOM	UNITED STATES
1.1 Selection and Evaluation of Separator Materials for High Temperature Operation 100-200°C		X	X	X	X				X
1.2 Long Term Testing of Promising Separator Materials in Large-Scale Equipment		X		X					X
1.3 Selection and Evaluation of Electrocatalysts for the Hydrogen and Oxygen Electrode Reactions	X	X	X	X	X			X	X
1.4 Long Term Testing of Promising Electrocatalysts in Commercial Equipment		X		X				X	
1.5 Selection and Evaluation of Electrode Materials and Current Collectors	X		X	X		X		X	X
1.6 Selection and Evaluation of Construction Materials (e.g., gaskets, seals, container materials)				X					X
1.7 Investigation of Cell Gas and Fluid Dynamics			X			X			
1.8 Optimization of Gas-Liquid Separators	X		X						

NET MAN YEARS

5 3,5 16 8 4 1 * 2 5 TOTAL:44,5

* subject to review

(b) Solid Polymer Electrolyte (SPE) Water Electrolysis Development. Each Participant will, in accordance with the following Table, be responsible for carrying out one or more of the Sub-Tasks indicated below:-

- (1) R and D on improved membranes;
- (2) R and D on electrode materials;
- (3) Investigations on electrocatalysts for hydrogen and oxygen electrode reactions;
- (4) Design and construction of 2 100 KW cell units;
- (5) Testing of the 2 100 KW cell units (one in USA, one in Europe);
- (6) Design and construction of an advanced 100 KW cell unit;
- (7) Design, construction and testing of a plant system, to prove the feasibility of meeting the following conditions:

Operating temperature	150°C
Pressure	40 atm
Anode over voltage	200 mv at 10,000 A/m ²
Overall system efficiency	85% (HHV of H ₂ produced/electrical power input)
System capital cost	100\$/kw (equivalent HHV of H ₂ produced)
Minimum module life	40,000 hours
System life	20 years

An overview of the participation in this task is presented in Table 2.

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TABLE 2

SOLID POLYMER ELECTROLYTE (SPE) WATER
ELECTROLYSIS DEVELOPMENT

C O U N T R I E S

TASK TITLES

	BELGIUM	CANADA	E.F.C.	ITALY	JAPAN	UNITED STATES
2.1 R&D on Improved Membranes	X	X	X	X		X
2.2 R&D on Electrode Materials			X	X	X	X
2.3 Electrocatalysts for H ₂ and O ₂ Evolution	X	X	X	X	X	X
2.4 Design and Fabrication of 100 KW System - 2 Units	X		X	X		
2.5 Testing of 100 KW System (2.4 and 2.6)			X	X		
2.6 Design and Fabrication of Advance 100 KW System						
2.7 Process System and Process Plant Design.	X					

NET MAN YEARS

5 1 6 8 3 10 TOTAL:33

(c) Within the first year of the implementation of this Annex, each Participant will provide to the Operating Agent publications in its possession which have relevance to the objectives of this Task. In addition, each Participant will provide to the Operating Agent copies of such internal reports and working papers resulting from the work outlined in paragraphs 2(a) and 2(b) as may be of interest to the other Participants. Further, each Participant on an annual basis will prepare a progress report on its work underway and submit it to the Operating Agent.

(d) The Operating Agent will compile and submit to the Executive Committee a work programme for the first year. The Executive Committee, acting by unanimity, shall approve a work programme for the first year, no later than three months after signature of this Annex. The work programme (including patent considerations) will outline the respective contributions of each Participant for accomplishing the objectives of the Task.

(e) At the end of the first and second years, a 3-4 day workshop will be held to discuss progress reports and to formulate the next year's detailed work programme. Organization of the workshop shall be the responsibility of the Operating Agent.

(f) Each participant will designate a person to be available to the Operating Agent as the technical contact point for each of the Sub-Tasks undertaken by the Participant pursuant to paragraphs 2(a) and 2(b).

(g) Exchange of researchers between the Participants is anticipated. The initiation of such exchanges will be left to the interested experts of the Participants under detailed arrangements to be agreed upon. The Participants will advise the Operating Agent of all such exchanges, as they occur, and the Operating Agent will compile and distribute to Participants regular reports on such exchanges.

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3. TIME SCHEDULE

This is envisioned as a three-year programme to begin on or about 1st January 1979. Annual workshops are planned.

4. RESULTS

The results of these co-operative activities will be:-
(a) Copies of all publications, internal reports and working papers which have been submitted to the Operating Agent in accordance with paragraph 2(c) will be compiled and distributed by the Operating Agent to all Participants, on a regular basis.

(b) At the end of each year and prior to the annual workshop, the Operating Agent will reproduce, collate, and distribute copies of the progress reports prepared by each Participant to all Participants, which will then be used as a basis for discussion at the workshops.

(c) A final report will be prepared by the Operating Agent.

5. RESPONSIBILITIES OF THE OPERATING AGENT

In addition to the responsibilities described in paragraphs 2 and 4 above, the Operating Agent will be responsible for the overall management of this Annex and for implementing actions required by the Executive Committee.

6. BUDGET

(a) Each Participant will bear its own costs in carrying out the Task, including costs of reporting and travel expenses of representatives.

(b) The cost of meeting organization shall be borne by the host country.

7. OPERATING AGENT

The United States Department of Energy acting through the Brookhaven National Laboratory.

8. INFORMATION AND INTELLECTUAL PROPERTY

(a) Executive Committee's Powers. The publication, distribution, handling, protection and ownership of information and intellectual property arising from activities conducted under this Annex shall be determined by the Executive Committee acting by unanimity, in conformity with this Agreement.

(b) The Right to Publish. Subject only to patent and copyright restrictions, the Annex IV Participants shall have the right to publish all information provided to or arising from Annex IV except proprietary information.

(c) Proprietary Information. The Annex IV Participants and the Operating Agent shall take all necessary measures in accordance with this paragraph, the laws of their respective countries and international law to protect proprietary information, provided to or arising from the programme. For the purpose of this paragraph proprietary information shall mean information of a confidential nature such as trade secrets and know-how, (for example, computer programmes, design procedures and techniques, chemical composition of materials, or manufacturing methods, processes or treatment) which is appropriately marked, provided such information:

- (1) Is not generally known or publicly available from other sources;
- (2) Has not previously been made available by the owner to others without obligations concerning its confidentiality; and
- (3) Is not already in the possession of the recipient Annex IV Participant without obligation concerning its confidentiality.

It shall be the responsibility of each Annex IV Participant supplying proprietary information and of the Operating Agent in respect of the arising proprietary information to identify the information as such and to ensure that it is properly marked.

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(d) Identification of Information by Governments. The Operating Agent shall encourage the governments of all Agency Participating Countries to make available or identify to the Operating Agent all published or otherwise freely available information known to them that is relevant to the Task.

(e) Identification of Information by Participants. The Annex IV Participants shall identify to the Operating Agent all pre-existing information, and information developed independently of their undertakings in Annex IV, known to the Annex IV Participants which is relevant to the Task and which:

(1) Can be made available to the Task without contractual or legal limitations.

(2) Will or can only be made available to the Task with contractual or legal limitations.

(f) Reports on Work Performed under the Task. The Operating Agent shall provide reports on all work performed under this Task and the results thereof, other than proprietary information, to the Executive Committee.

(g) Arising Inventions. Inventions made or conceived in the course of or under this Task (arising inventions) shall be owned in all countries by the inventing Annex IV Participant. Information regarding inventions on which patent protection is to be obtained by an Annex IV Participant shall not be published or publicly disclosed by the other Annex IV Participant until a patent application has been filed, provided, however, that this restriction on publication or distribution shall not be extended beyond six months from the date of receipt of such information. It shall be the responsibility of the inventing Annex IV Participant or of the Operating Agent to appropriately mark reports which disclose inventions which have not been appropriately protected by the filing of a patent application.

(h) License of Proprietary Information and Patents Needed for Task. Each Annex IV Participant agrees to license all pre-existing proprietary information and pre-existing patents solely owned or controlled by it which are necessary for use in the Task, and all arising proprietary information and inventions covered by patents to any other Annex IV Participant for use in its undertakings in Annex IV only at no cost to the other Participant. If such proprietary information or patents are partially owned or controlled by an Annex IV Participant, then efforts shall be made by the Annex IV Participant to reduce or eliminate as far as possible the benefits that might accrue to it.

(i) License of Proprietary Information and Patents for Other Reasons. Each Annex IV Participant agrees to license all pre-existing proprietary information and patents solely owned or controlled by it which are necessary for practising the results of the undertakings in Annex IV and which have been utilized in the Task, and all arising proprietary information and inventions covered by patents to the other Annex IV Participants, their governments and the nationals of their respective countries designated by them on reasonable terms and conditions for use in all countries for hydrogen production.

The Annex IV Participants agree to license all arising proprietary information and inventions covered by patents to all Agency Participating Countries on reasonable terms and conditions for use in their own country in order to meet their energy needs.

(j) Copyrights. Each Annex IV Participant may and the Operating Agent shall take appropriate measures necessary to protect copyrightable material generated under the Task. Copyrights obtained shall be the property of the Annex IV Participant or the Operating Agent, provided, however, that other Annex IV Participants may reproduce and distribute such material but shall not publish it with a view to profit.

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(k) Inventors and Authors. Each Annex IV Participant will, without prejudice to any rights of inventors or authors under its national laws, take all necessary steps to provide the co-operation from its authors and inventors required to carry out the provisions of this Article. Each Annex IV Participant will assume the responsibility to pay awards or compensation required to be paid to its employees according to the laws of its country.

(l) Determination of "National". The Executive Committee may establish guidelines to determine what constitutes a "national" of a Participant. In view of the participation of the Commission of the European Communities, any Member State of the European Communities which is not a Participant under this Annex IV shall be understood to be included as governments and countries in sub-paragraph (i) of this paragraph for purposes of entitlement to a license for arising proprietary information and inventions. Such Member State and its designated nationals who wish to avail themselves of a license for pre-existing proprietary information and patents under sub-paragraph (i) above may elect to do, but must make available at the time of election their proprietary information and patents developed under their programmes which are useful in practicing the Task results under the terms and conditions stated in sub-paragraph (i) above to Annex IV Participants, their governments and the nationals of their respective countries designated by them.

9. PARTICIPANTS IN THIS ANNEX

The Contracting Parties which are Participants in this Annex are the following:-

The Centre d'Etude de l'Energie Nucléaire (Belgium)

The Department of Energy Mines & Resources (Canada)

The Commission of the European Communities

The Comitato Nazionale per l'Energia Nucleare (Italy)

The Government of Japan

The Naamlooze Vennootschap DSM (Netherlands)

The Government of Switzerland

The Government of the United Kingdom

The Department of Energy (United States of America)

ANNEX V

SOLID OXIDE WATER VAPOUR ELECTROLYSIS

1. OBJECTIVES

The objective of this Task is the design, development and demonstration of the engineering feasibility of a small pre-prototype high temperature solid electrolyte water electrolyzer module - (consisting of an assembly of cells in series, connected in parallel banks) - which should be suitable for scaling to larger commercial sizes and able to sustain a life test simulating commercial operation conditions.

2. MEANS

(a) Each participant will, in accordance with the following Table, be responsible for carrying out one or more of the Sub-Tasks indicated below:-

- (1) Selection, evaluation and determination of the possibility to fabricate electrode materials compatible with electrolyte and interconnection materials;
- (2) Selection, fabrication and testing of interconnection materials;
- (3) Design, development, testing and fabrication of multi-cells (3 to 100 cells);
- (4) Development of a conceptual design of a pre-prototype module, and of the related processing steps for its fabrication;
- (5) Design and construction of one or more pre-prototype electrolyzer module(s) and its (or their) testing both as electrolyzer and as fuel cells;
- (6) Testing and evaluation of the possible lifetime of cell components.

An overview of the participation is presented in Table 3.

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TABLE 3

SOLID OXIDE WATER VAPOR ELECTROLYSIS DEVELOPMENT

C O U N T R I E S

TASK TITLES	C O U N T R I E S						
	CANADA	U.S.A.	GERMANY	ITALY	SWITZERLAND	UNITED KINGDOM	UNITED STATES
3.1 R&D On Electrolytes	X	X	X	X		X	X
3.2 R&D on Electrode Materials		X	X	X		X	X
3.3 R&D on Interconnection Materials			X	X		X	X
3.4 Multi-Cell Design and Fabrication			X	X			X
3.5 Process Design			X	X			X
3.6 Design and Fabrication of Prototype - 2 Units			X	X			

NET MAN YEARS 0,5 2,5 2 4 . * ** *** 35 6 TOTAL:50

* subject to review

** past work

*** including 35 man years past work UK; without past work total is 15 man years

(b) Within the first year of the implementation of this Annex, each Participant will provide to the Operating Agent publications in its possession which have relevance to the objectives of this Task. In addition, each Participant will provide to the Operating Agent copies of such internal reports and working papers resulting from the work outlined in paragraph 2(a) as may be of interest to the other Participants. Further, each Participant on an annual basis will prepare a progress report on its work underway and submit it to the Operating Agent.

(c) The Operating Agent will compile and submit to the Executive Committee a work programme for the first year. The Executive Committee, acting by unanimity, shall approve a work programme for the first year, no later than three months after signature of this Annex. The work programme (including patent considerations) will outline the respective contributions of each Participant for accomplishing the objectives of the Task.

(d) At the end of the first and second years, a 3-4 day workshop will be held to discuss progress reports and to formulate the next year's detailed work programme. Organization of the workshop shall be the responsibility of the Operating Agent.

(e) Each Participant will designate a person to be available to the Operating Agent as the technical contact point for each of the Sub-Tasks undertaken by the Participant pursuant to paragraph 2(a).

(f) Exchange of researchers between the Participants is anticipated. The initiation of such exchanges will be left to the interested experts of the Participants under detailed arrangements to be agreed upon. The Participants will advise the Operating Agent of all such exchanges, as they occur, and the Operating Agent will compile and distribute to Participants regular reports on such exchanges.

3. TIME SCHEDULE

This is envisioned as a three year programme to begin on or about 1st January 1979. Annual workshops are planned.

4. RESULTS

The results of these co-operative activities will be:

(a) Copies of all publications, internal reports and working papers which have been submitted to the Operating Agent in accordance with paragraph 2(b) will be compiled and distributed by the Operating Agent to all Participants, on a regular basis.

(b) At the end of each year and prior to the annual workshop, the Operating Agent will reproduce, collate, and distribute copies of the progress reports prepared by each Participant to all Participants, which will then be used as a basis for discussion at the workshops.

(c) A final report will be prepared by the Operating Agent.

5. RESPONSIBILITIES OF THE OPERATING AGENT

In addition to the responsibilities described in paragraphs 2 and 4 above, the Operating Agent will be responsible for the overall management of this Annex and for implementing actions required by the Executive Committee.

6. BUDGET

(a) Each Participant will bear its own costs in carrying out the Task, including costs of reporting and travel expenses of representatives.

(b) The cost of meeting organization shall be borne by the host country.

7. OPERATING AGENT

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(*) Confirmation of the Operating Agent is to be expected in the next few weeks.

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8. INFORMATION AND INTELLECTUAL PROPERTY

(a) Executive Committee's Powers. The publication, distribution, handling, protection and ownership of information and intellectual property arising from activities conducted under this Annex shall be determined by the Executive Committee acting by unanimity, in conformity with this Agreement.

(b) The Right to Publish. Subject only to patent and copyright restrictions, the Annex V Participants shall have the right to publish all information provided to or arising from Annex V except proprietary information.

(c) Proprietary Information. The Annex V Participants and the Operating Agent shall take all necessary measures in accordance with this paragraph, the laws of their respective countries and international law to protect proprietary information, provided to or arising from the programme. For the purpose of this paragraph proprietary information shall mean information of a confidential nature such as trade secrets and know-how (for example, computer programmes, design procedures and techniques, chemical composition of materials, or manufacturing methods, processes or treatment) which is appropriately marked, provided such information:

- (1) Is not generally known or publicly available from other sources;
- (2) Has not previously been made available by the owner to others without obligations concerning its confidentiality; and
- (3) Is not already in the possession of the recipient Annex V Participant without obligation concerning its confidentiality.

It shall be the responsibility of each Annex V Participant supplying proprietary information and of the Operating Agent in respect of the arising proprietary information to identify the information as such and to ensure that it is properly marked.

(d) Identification of Information by Governments. The Operating Agent shall encourage the governments of all Agency Participating Countries to make available or identify to the Operating Agent all published or otherwise freely available information known to them that is relevant to the Task.

(e) Identification of Information by Participants. The Annex V Participants shall identify to the Operating Agent all pre-existing information, and information developed independently of their undertakings in Annex V, known to the Annex V Participants which is relevant to the Task and which:

- (1) Can be made available to the Task without contractual or legal limitations.
- (2) Will or can only be made available to the Task with contractual or legal limitations.

(f) Reports on Work Performed under the Task. The Operating Agent shall provide reports on all work performed under this Task and the results thereof, other than proprietary information, to the Executive Committee.

(g) Arising Inventions. Inventions made or conceived in the course of or under this Task (arising inventions) shall be owned in all countries by the inventing Annex V Participant. Information regarding inventions on which patent protection is to be obtained by an Annex V Participant shall not be published or publicly disclosed by the other Annex V Participant until a patent application has been filed, provided, however, that this restriction on publication or distribution shall not be extended beyond six months from the date of receipt of such information. It shall be the responsibility of the inventing Annex V Participant or of the Operating Agent to appropriately mark reports which disclose inventions which have not been appropriately protected by the filing of a patent application.

(h) License of Proprietary Information and Patents Needed for Task. Each Annex V Participant agrees to license all pre-existing proprietary information and pre-existing patents solely owned or controlled by it which are necessary for use in the Task, and all arising proprietary information and inventions covered by patents to any other Annex V Participant for use in its undertakings in Annex V only at no cost to the other Participant. If such proprietary information or patents are partially owned or controlled by an Annex V Participant, then efforts shall be made by the Annex V Participant to reduce or eliminate as far as possible the benefits that might accrue to it.

(i) License of Proprietary Information and Patents for Other Reasons. Each Annex V Participant agrees to license all pre-existing proprietary information and patents solely owned or controlled by it which are necessary for practicing the results of the undertakings in Annex V and which have been utilized in the Task, and all arising proprietary information and inventions covered by patents to the other Annex V Participants, their governments and the nationals of their respective countries designated by them on reasonable terms and conditions for use in all countries for hydrogen production.

The Annex V Participants agree to license all arising proprietary information and inventions covered by patents to all Agency Participating Countries on reasonable terms and conditions for use in their own country in order to meet their energy needs.

(j) Copyrights. Each Annex V Participant may and the Operating Agent shall take appropriate measures necessary to protect copyrightable material generated under the Task. Copyrights obtained shall be the property of the Annex V Participant or the Operating Agent, provided, however, that other Annex V Participants may reproduce and distribute such material, but shall not publish it with a view to profit.

(k) Inventors and Authors. Each Annex V Participant will, without prejudice to any rights of inventors or authors under its national laws, take all necessary steps to provide the co-operation from its authors and inventors required to carry out the provisions of this Article. Each Annex V Participant will assume the responsibility to pay awards or compensation required to be paid to its employees according to the laws of its country.

(l) Determination of "National". The Executive Committee may establish guidelines to determine what constitutes a "national" of a Participant. In view of the participation of the Commission of the European Communities, any Member State of the European Communities which is not a Participant under this Annex V shall be understood to be included as governments and countries in sub-paragraph (i) of this paragraph for purposes of entitlement to a license for arising proprietary information and inventions. Such Member State and its designated nationals who wish to avail themselves of a license for pre-existing proprietary information and patents under sub-paragraph (i) above may elect to do, but must make available at the time of election their proprietary information and patents developed under their programmes, which are useful in practicing the Task results under the terms and conditions stated in sub-paragraph (i) above to Annex V Participants, their governments and the nationals of their respective countries designated by them.

9. PARTICIPANTS IN THIS ANNEX

The Contracting Parties which are Participants in this Annex are the following:-

The Department of Energy Mines & Resources (Canada)

The Commission of the European Communities

The Kernforschungsanlage Jülich GmbH (Germany)

The Comitato Nazionale per l'Energia Nucleare (Italy)

The Government of Switzerland

The Government of the United Kingdom

The Department of Energy (United States of America).