EUROPEAN COMMISSION

TECHNICAL EXCHANGE AND COOPERATION ARRANGEMENT

BETWEEN

THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

AND

THE EUROPEAN ATOMIC ENERGY COMMUNITY

AS REPRESENTED BY

THE COMMISSION OF THE EUROPEAN COMMUNITIES

IN THE FIELD OF

NUCLEAR-RELATED TECHNOLOGY RESEARCH AND DEVELOPMENT

Whereas, the Department of Energy of the United States of America (USDOE) and the European Atomic Energy Community (EURATOM), represented by the Commission of the European Communities, hereinafter referred to as the "Parties";

Recognising there is a mutual interest to broaden co-operation in the field of nuclear related technology research and development; and

Desiring to ensure the safe development, maintenance, and life of nuclear reactors, the disposal of civilian radioactive waste and the nuclear fuel cycle on an international basis;

HEREBY AGREE AS FOLLOWS:

ARTICLE 1 - OBJECTIVE

The objective of this Technical Arrangement is to establish a framework for co-operation between the Parties in the field of nuclear-related technology research and development based upon mutual benefit. The co-operation is intended to occur in specific areas where the programs of the Parties complement one another as well as those in which comparability exists.

ARTICLE 2 - AREAS OF COOPERATION

The Parties desire to co-operate in those areas listed in Annex A. Other areas may be added by mutual written agreement of the Parties.

ARTICLE 3 - FORMS OF COOPERATION

Forms of co-operation under this Technical Arrangement may include, but are not limited to, the following:

(1) The execution of joint programs and co-operative research projects, such as those involving a division of activities between the Parties, including the use of test facilities and/or computer programs sponsored by either Party.

(2) The use by one Party of facilities which are owned by the other Party or in which research is being sponsored by the other Party.

(3) Visits by scientists, engineers, specialist teams, individuals, professional staff, post doctorate and university staff for agreed upon periods of time in order to participate in experiments, analysis, design and other research and development activities at existing and new research centres, laboratories, engineering offices and other facilities and enterprises of each of the Parties or its associated organisations or contractors.

(4) Possible temporary assignment of personnel of one Party, or its contractors, to the laboratory or facilities owned by the other Party or in which it sponsors research.

(5) Meetings of various forms to discuss and exchange information on scientific and technological aspects of general or specific subjects in the areas listed in Annex A, and to identify additional co-operative actions which may be usefully undertaken.

(6) Exchange and provision of information and data on scientific and technical activities, developments, practices and results, and on program policies and plans including exchange of proprietary information on the terms and conditions in accordance with Article 5.

(7) Exchange and provision of samples, materials and equipment for experiments, testing and evaluation in accordance with Articles 10 and 11.

(8) Other specific forms of collaboration may be added by mutual written agreement of the Parties.

ARTICLE 4 - MANAGEMENT

(1) As a first step, this Technical Arrangement provides for the establishment of a DOE/EU Nuclear Technology Research and Development Steering Committee where expert groups will be established in areas of co-operation identified in Annex A.

(2) To supervise the execution of this Technical Arrangement, each Party shall name a Principal Co-ordinator. The Principal Co-ordinators, who lead the Steering Committee noted in Article 4.1, shall meet each year, alternately in the United States and the European Community, or at such other times and places as agreed.

(3) At their meetings, the Principal Co-ordinators shall evaluate the status of co-operation under this Technical Arrangement. This evaluation may include a review of the past year's activities and accomplishments under this Technical Arrangement, a review of the activities planned for the coming year within each of the various areas of co-operation listed in Annex A, an assessment of the balances of exchanges under this Technical Arrangement within each of the areas of co-operation listed in Annex A, and a consideration of measures required to correct any imbalances. In addition, the Principal Co-ordinators shall consider and act on any major new proposals for co-operation.

(4) The activities referred to in Articles 3.1 and 3.2 will be defined and listed on action sheets. New co-operative projects can be defined and added to these action sheets after approval by the Principal Co-ordinators. The action sheets will specify the tasks to be undertaken, the time schedule, and the resources committed by each Party.

(5) Day-to-day management of the co-operation under this Technical Arrangement shall be carried out by Technical Co-ordinators designated by the Principal Co-ordinators. The Technical Co-ordinators shall agree on specific details of co-operation in the technical areas listed in Annex A within policy guidelines established by the Principal Co-ordinators. The Technical Co-ordinators shall be responsible for working contacts between the Parties in their respective areas of co-operation.

ARTICLE 5 - AVAILABILITY AND DISSEMINATION OF INFORMATION

(1) Subject to applicable laws and regulations and to its obligations to third parties, as well as to the provisions of this Technical Arrangement, each Party and its designees will undertake to make freely available to the other Party and its designee any information at its disposal which is required for the execution of this Technical Arrangement.

(2) The Parties support the widest possible dissemination of information which they have the right to disclose, either in their possession or available to them and which is either developed jointly or intended to be provided or exchanged pursuant to this Technical Arrangement, subject to the need to protect undisclosed documentary information and intellectual property arising under this Technical Arrangement.

ARTICLE 6 - COSTS

(1) Except as otherwise specifically agreed upon in writing by the Parties, all costs arising in the implementation of this Technical Arrangement will be borne by the Party that incurs them.

(2) The ability of the Parties to carry out their obligations is subject to the availability of appropriated funds.

ARTICLE 7 - INTELLECTUAL PROPERTY RIGHTS

Rights related to any form of intellectual property arising under this Technical Arrangement shall be allocated in conformity with the rules and procedures set out in the Intellectual Property Rights Annex (Annex B) which is an integral parts of this Technical Arrangement.

ARTICLE 8 - DISCLAIMER

Information given by one Party to the other Party under this Technical Arrangement will be accurate to the best knowledge and belief of the Party giving it, but neither Party gives any warranty as to the accuracy of such information or will have any responsibility for the consequences of any use to which such information may be put by the other Party or by any third party.

ARTICLE 9 - EXCHANGE OF PERSONNEL

Unless otherwise agreed in writing, the following provisions shall apply concerning assignments and exchanges of personnel under this Technical Arrangement:

(1) Each Party may, at its own expense, and subject to agreement of the other Party, observe test activities and analytical work of the other Party. Such observation may be accomplished by short-term visits or by the assignment of personnel, subject to the prior agreement of the receiving Party on each occasion.

(2) Whenever an assignment or exchange of personnel is contemplated under this Technical Arrangement, each Party shall select qualified staff for assignment to the other Party to conduct the activities planned under this Technical Arrangement. Each such exchange of personnel shall be mutually agreed in advance by an exchange of letters between the Parties, referencing this Technical Arrangement and its pertinent intellectual property provisions.

(3) Each Party shall be responsible for the salaries, insurance, and allowances to be paid to its staff or contractors.

(4) Each Party shall pay for the travel and living expenses of its staff while on assignment to the host Party, unless otherwise agreed.

(5) Each Party shall arrange for accommodations for the other Party's assigned staff or its contractors (and their families) on a mutually agreeable reciprocal basis.

(6) The host Party shall provide all necessary assistance to the assigned staff or its contractors (and their families) of the other Party regarding administrative formalities.

(7) The staff of each Party and its contractors shall be subject to the general and special rules of work and safety regulations in force at the host establishment.

ARTICLE 10 - EQUIPMENT

Unless otherwise agreed in writing, the following provisions shall apply to the provision of equipment by one Party to the other Party under this Technical Arrangement:

(1) The sending Party shall supply to the other Party as soon as possible a detailed list of the equipment to be provided, together with the associated specifications and technical and informational documentation.

(2) The equipment, spare parts, and documentation supplied by the sending Party shall remain the property of the sending Party and shall be returned to the sending Party upon completion of the mutually agreed upon activity unless otherwise agreed.

(3) The host establishment shall provide the necessary premises and shelter for the equipment, and shall provide for electric power, water and gas, as appropriate, in accordance with all technical requirements, which shall be as mutually agreed upon by the Parties.

(4) The sending Party, or its designee(s), shall be responsible for expenses, safekeeping and insurance during the transport of the material from the original location in the country, or its establishments in the case of Euratom, of the sending Party to the place of entry in the country of the receiving Party, or its establishments in the case of Euratom. If the sending Party elects to have the material returned, the sending Party shall be responsible for expenses, safekeeping, and insurance during the transport of the material from the original point of entry in the country of the receiving Party, or its establishment in the case of Euratom, to the final destination in the country of the sending Party, or its establishment in the case of Euratom.

(5) The receiving Party, or its designee(s), shall be responsible for expenses, safekeeping, and insurance during the transport of the material from the place of entry in the country of the receiving Party, or its establishments in the case of Euratom, to the final destination in the country of the receiving Party, or its establishments in the case of Euratom. If the sending Party elects to have the material returned, the receiving Party shall be responsible for expenses, safekeeping, and insurance during the transport of the material from the final destination in the country of the receiving Party, or its establishment in the case of Euratom, to the original point of entry in the country of the receiving Party, or its establishment in the case of Euratom.

(6) The equipment provided by the sending Party for carrying out mutually agreed-upon activities shall be considered to be scientific, not having a commercial character.

ARTICLE 11 - SAMPLES AND MATERIALS

Unless otherwise agreed in writing, the following provisions shall apply to the transportation and use of samples and materials under this Technical Arrangement:

(1) Unless otherwise agreed by the Parties prior to delivery, samples and materials provided by the sending Party to the receiving Party shall be used for experiments, testing and evaluation and shall not be returned to the sending Party.

(2) Where one Party requests that a sample or material be provided by the other Party, the Party making the request shall bear all costs and expenses associated with the transportation of the sample or material from the location of the sending Party to the final destination.

(3) Each Party shall promptly disclose to the other Party all information arising from the examination or testing of samples or materials exchanged under this Technical Arrangement. Proprietary information, as defined in Annex B, section III., which was developed prior to or outside the scope of this Technical Arrangement, shall remain proprietary information even though it is contained in the results of an examination or testing of samples or materials. Such information shall be identified as proprietary by the Party asserting its proprietary nature as soon as possible after disclosure of all information arising from the examination or testing is made to such Party and the other Party shall be immediately advised of that identification. All information identified as proprietary shall be controlled as provided under Annex B, section III. It is further understood and agreed that one Party providing samples or materials to the other Party may also provide a partial or complete list of the types of information which will arise from the examination or testing of such samples or materials and which is proprietary information as defined in Annex B, section III, and all such proprietary information is to be controlled as set out in Annex B. section III.

ARTICLE 12 - GENERAL PROVISIONS

(1) Collaboration and activities under this Technical Arrangement shall be subject to the applicable laws and regulations, policies and programs of the Parties.

(2) All questions or disputes related to the interpretation or implementation of this Technical Arrangement shall be settled by the Parties by mutual agreement.

Annex A

Areas of Co-operation

A – NUCLEAR ENERGY RESEARCH, INCLUDING INNOVATIVE OR REVISITED REACTOR CONCEPTS

- new reactor design (proliferation resistant reactors, high efficiency reactors, low power reactors, economics, safety, instrumentation, concepts to improve performance and operation, simplify the design, enhance safety and reduce cost, reduction in the construction cost), including: high temperature reactors, fast neutron reactors, small and/or other reactor concepts
- fundamental nuclear science (material, chemical and computational science)

B - PLANT LIFE EXTENTION AND MANAGEMENT (PLANT MODERNIZATION) & OPTIMIZATION

- management of the long-term effects of nuclear plant component aging (steam generators, reactor pressure vessel and internals, cables, piping, pumps, valves)
- optimization of nuclear power plant generation capacity (digital I&C upgrades, advanced sensor technologies, advanced monitoring, diagnostics and control systems
- preventing damage to reactor cores
- plant performance
- probabilistic safety assessment (PSA level 1)
- human performance (man-machine interface and organization of safety)
- multiphase thermal-hydraulics and coupling with neutronics

C – ACCELERATOR TRANSMUTATION OF WASTE (ATW)

- lifetimes of material and components
- reliability and availability of the ATW system
- operational safety of the ATW system (consistent with regulatory requirements)
- degree of partitioning and separation achievable for uranium, transuranics and long lived fission products produced)
- spallation target and Pb-Bi coolant loop

D - INTEGRITY OF REACTOR COMPONENTS

- non-destructive testing (e.g., holography; acoustic emission gamma, X-ray, ultrasonic and eddy current testing)
- validation of inspection methods including in-service inspection and risk-informed approaches

- critical industrial component testing and evaluation
- high-temperature corrosion, and creep fatigue
- aged materials characteristics (including irradiation testing at the High Flux Reactor(HFR))
- early fault diagnosis
- behaviour of materials under dynamic loading
- seismic resistance

E - SEVERE ACCIDENTS MANAGEMENT AND REACTOR CONTAINMENT PERFORMANCE

- analytical investigations on in-vessel phenomena (e.g., core degradation, FCI, corium relocation, lower head load, fission product and hydrogen releases)
- analytical investigations on ex-vessel phenomena (e.g., corium spreading and cooling, hydrogen dispersion and burns)
- fission products behaviour (release, transport, deposition and resuspension in circuit components, deposition in containment, chemistry)
- leak tightness of concrete structures
- PSA Level 2

F - FUELS

- advanced nuclear fuel development
- nuclear fuel behaviour (including high burn-up effects on fuel pin thermomechanical properties, behaviour in transients, consequences for waste)
- new fuel cycle concepts
- revisited fuel cycle concepts (e.g., thorium fuel cycle)

G - HIGH LEVEL WASTE MANAGEMENT

- management strategies
- deep geological disposal (e.g., repository technology, long-term behavior of repository components, performance assessment studies)
- partitioning and transmutation (aqueous and dry separation technologies, preparation of irradiation targets)
- behaviour of spent fuel under conditions of long term storage
- radiotoxicity

- basic actinides research
- accelerator driven systems (ADS)

H – ISOTOPE DEVELOPMENT WITH NUCLEAR MEDICINE APPLICATIONS

- isotopes production and availability
- radio-isotope research
- boron neutrons capture therapy
- alpha-emitting isotopes
- training

I - URANIUM PROGRAMMES

- highly enriched uranium equipment shutdown and inventory disposition
- maintenance of leased and non-leased facilities including corrective actions and nuclear safety
- pre-existing liabilities
- depleted uranium hexafluoride cylinders and maintenance
- depleted uranium hexafluoride conversion and management project

J - RADIOPROTECTION

- radiobiology
- epidemiology
- dosimetry
- radioecology
- emergency Management
- risk Assessment and Management

Annex B

Intellectual Property Rights

The Parties shall ensure adequate and effective protection of intellectual property created or furnished under this Technical Arrangement and relevant project agreements. The Parties agree to notify one another in a timely fashion of any inventions or copyrighted works arising under this Technical Arrangement and to seek protection for such intellectual property in a timely fashion. Rights to such intellectual property shall be allocated as provided in this Annex.

1. SCOPE

(1) This Annex is applicable to all co-operative activities undertaken by the Parties or their participants pursuant to this Technical Arrangement, except as otherwise specifically agreed by the Parties.

(2) For purposes of this Technical Arrangement, "intellectual property" shall have the meaning found in Article 2 of the Convention Establishing the World Intellectual Property Organisation, done at Stockholm, July 14, 1967.

(3) This Annex addresses the allocation of rights, interests, and royalties between the Parties or their participants. Each Party shall ensure that the other Party or its participants can obtain the rights to intellectual property allocated in accordance with this Annex. This Annex does not otherwise alter or prejudice the allocation between a Party and its nationals, which shall be determined by that Party's laws and practices.

(4) Disputes concerning intellectual property arising under this Technical Arrangement should be resolved through discussions between the relevant participants, or, if necessary, the Parties. Upon mutual agreement of the Parties, the participants may submit a dispute to an arbitral tribunal for binding arbitration. Unless the participants agree otherwise in writing, the arbitration rules of UNCITRAL shall govern.

(5) Termination or expiration of this Technical Arrangement shall not affect rights or obligations under this Annex.

2. ALLOCATION OF RIGHTS

(1) Each Party shall be entitled to a non-exclusive, irrevocable, royalty-free license in all countries to reproduce, publicly distribute and translate scientific and technical journal articles, non-proprietary scientific reports, and books directly arising from co-operation under this Technical Arrangement. All publicly distributed copies of a copyrighted work prepared under this provision shall indicate the names of the authors of the work unless an author explicitly declines to be named. Each Party or its participants shall have the right to review a translation prior to public distribution.

(2) Rights to all forms of intellectual property, other than those rights described in section II.A above, shall be allocated as follows:

- (i) Visiting researchers, for example, scientists visiting primarily in furtherance of their education, shall receive intellectual property rights under arrangements with their host institutions. In addition, each visiting researcher named as an inventor shall be entitled to awards, bonuses, benefits, or any other rewards, in accordance with the policies of the host institution.

- (ii)(a) For intellectual property which is or may be created during joint research, the Parties or their participants shall jointly develop a technology management plan. The technology management plan shall consider the relative contributions of the Parties and their participants, the benefits of licensing by territory or for fields of use, requirements imposed by the Parties' domestic laws, and other factors deemed appropriate.

- (ii)(b) If the Parties or their participants did not agree to a joint technology management plan in the initial research co-operation agreement and cannot reach an agreement within a reasonable time, not to exceed six months, from the time a Party becomes aware of the creation or likely creation of the intellectual property in question as a result of the joint research, the Parties or their participants shall resolve the matter in accordance with the provisions of section I.D. Pending resolution of the matter, such intellectual property shall be owned jointly by the Parties or their participants, but shall be commercially exploited (including product development) only by mutual agreement.

- (ii)(c) "Joint research" means research that is implemented with financial support from one or both Parties and that involves collaboration by participants from both EURATOM and the United States of America and is designated as joint research in writing by the Parties or their scientific and technological organisations and agencies, or in the case where there is funding by only one Party, by that Party and the participants in that project.

- (ii)(d) In the event that either Party believes that a particular joint research project under this Technical Arrangement has led or will lead to the creation or furnishing of a type of intellectual property that it protects but is not protected throughout the territory of the other Party, the Parties shall immediately hold discussions to determine the allocation of the rights to the said intellectual property. The joint activities in question will be suspended during the discussions, unless otherwise agreed by the Parties thereto. If no agreement can be reached within a three-month period from the date of the request for discussions, co-operation on the project in question will be suspended or terminated at the request of either Party.

3. PROPRIETARY INFORMATION

In the event that information identified in a timely fashion as proprietary is furnished or created under the Technical Arrangement, each Party and its participants shall protect such information in accordance with applicable laws, regulations, and administrative practices. Without prior written consent, none of the Parties shall disclose any proprietary information except to employees, government personnel, and prime and subcontractors.

Such disclosures shall be for use only within the terms of their permits or licenses with the Parties or the scope of work of their contracts with the Parties and in work relating to the subject matter of the information so disseminated. The Parties shall impose, or shall have imposed, through appropriate arrangements such as research contracts, grant documents, technology management plans, etc, an obligation on all participants receiving such information to keep it confidential.

If one of the Parties becomes aware that, under its laws or regulations, it will be, or may reasonably be expected to become, unable to meet the non-disclosure provisions, it shall immediately inform the other Party. The Parties shall thereafter consult to define an appropriate course of action. Information may be identified as proprietary if it is secret in the sense that it is not, as a body or in the precise configuration or assembly of its components, generally known or readily accessible by lawful means; has actual or potential commercial value by virtue of its secrecy; has been subject to steps that were reasonable under the circumstances by the person lawfully in control, to maintain its secrecy; and not already in the possession of the recipient without an obligation concerning its confidentiality.

ARTICLE 13 - DURATION AND TERMINATION

(1) This Technical Arrangement will enter into force upon signature and shall remain in force for a period of five (5) years. This Technical Arrangement shall be automatically extended for additional five (5) year periods unless either Party notifies the other in writing six months prior to the expiration of the first five-year period or each succeeding five-year period of its intent to terminate this Technical Arrangement.

(2) This Technical Arrangement may be amended by mutual written agreement of the Parties.

Done in duplicate at Brussels this 6 March 2003.

FOR THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA:

Secretary of Energy,

Spencer Abraham.

FOR THE EUROPEAN ATOMIC ENERGY COMMUNITY AS REPRESENTED BY THE COMMISSION OF THE EUROPEAN COMMUNITIES:

Commissioner,

Philippe Busquin.