

**IMPLEMENTING ARRANGEMENT
BETWEEN
THE UNITED STATES DEPARTMENT OF ENERGY
AND
THE DEPARTMENT OF NATURAL RESOURCES OF CANADA
AND
ATOMIC ENERGY OF CANADA LIMITED
FOR COLLABORATION
IN THE AREA OF NUCLEAR ENERGY RESEARCH**

This Implementing Arrangement is made between the Department of Energy (DOE) of the United States of America and the Department of Natural Resources of Canada (NRCan) and (in support of NRCan) Atomic Energy of Canada Limited (AECL), collectively, hereinafter referred to as the "Participants".

WHEREAS the Memorandum of Understanding on Collaboration in Energy Research and Development (hereinafter referred to as the "Energy R&D MOU") between DOE and NRCan which was signed on March 18, 1998, supports wide cooperation in the areas of research and development;

WHEREAS AECL is a Crown Corporation that reports to the Government of Canada through the Minister of Natural Resources and acknowledging that AECL has principal responsibility for undertaking nuclear energy R&D in Canada and, as such, has been designated by NRCan as being responsible for implementation activities under this Implementing Arrangement;

ACKNOWLEDGING the desire of DOE and NRCan to include nuclear energy research as a field of collaboration under the Energy R&D MOU and that DOE and NRCan have agreed to this cooperation in exchanges of correspondence dated June 5, 2002 and June 24, 2002);

RECOGNIZING the long history of productive cooperation between DOE and NRCan both informally and formally;

BELIEVING the Participants have capabilities which can assist each other in specific areas in their effort to advance the status of nuclear energy research and development and, in particular, those areas of nuclear energy R&D that are in the interest of the International Nuclear Energy Research Initiative; and

NOTING that Article 4 of the Energy R&D MOU provides for the execution of written Implementing Arrangements governing cooperation under the Energy R&D MOU:

NOW THE PARTICIPANTS HEREBY AGREE:

Article 1 - Objective

1. The objective of this Implementing Arrangement is to establish a framework for collaboration between the Participants on research and development programs (R&D) and activities aimed at furthering a basic understanding of, and finding solutions to, common problems associated with nuclear energy and its applications and for improving the cost, safety and proliferation-resistance of nuclear energy systems. The Participants acknowledge and agree that collaboration on R & D under this Implementing Arrangement will involve some or all of the Participants, as determined on a case by case basis.
2. The Participants will engage in this cooperation as part of an International Nuclear Energy Research Initiative (I-NERI) program. The objective of I-NERI is to provide an effective means for international collaboration directed toward achieving better coordinated and more cost effective energy R&D for the mutual benefit of the Participants, based on equality and reciprocity, with each Participant bearing the costs it incurs, unless otherwise agreed to in writing by the Participants.
3. Cooperation under this Implementing Arrangement shall be subject to the terms and conditions of the Energy R & D MOU. The Participants agree to provide results of all activities undertaken under this Implementing Arrangement to the Joint Standing Committee on Nuclear Energy Cooperation during its annual meetings.

Article 2 - Areas of Collaboration

1. Technical areas for collaboration under this Implementing Arrangement include but are not limited to research, development and demonstration activities related to the following topics, and other related topics as may be agreed in writing:

- a. Sustainable and Advanced Fuel Cycles

An important goal of nuclear development is enhanced sustainability, via nuclear fuel cycles that will enhance long-term availability of systems and will improve fuel utilization. The nuclear fuel cycle can be optimized to minimize spent fuel storage needs, waste streams, and waste disposal requirements. Areas for collaboration include:

- development of optimum fuel cycles, fuel types and processing methods;
- analysis of the benefits in resource utilization and waste minimization;
- development of requirements for a secure and sustainable North American fuel supply.

b. Supercritical Water Reactor Concepts

Supercritical nuclear power reactors are a particularly promising, high efficiency class of high temperature, high thermal efficiency water-cooled reactors that operate above the thermodynamic critical point of water. These nuclear steam supply systems may have a thermal or fast neutron spectrum and may use either light water or heavy water moderation. Areas for collaboration include:

- high temperature materials;
- core neutron physics;
- heat transfer performance;
- fuel design; and
- cost estimating/financial analyses methods and models.

c. Hydrogen Production By Nuclear Systems

The production of hydrogen, without concomitant green-house gases (GHG) emissions, is a major element of the transition to a low-GHG hydrogen-enhanced energy economy. Nuclear energy is one promising means to do this. Areas for collaboration include but are not limited to:

- high efficiency electrolysis, fuel cells and high-temperature processes for a range of thermo-chemical conditions;
- optimization of product streams and efficiencies; and
- assessment of hydrogen applications to contribute to “zero emissions” transportation.

d. Safety and Design Codes

Introduction of advanced nuclear options will involve extending the applicability or validation basis of safety and design computer codes to cover adjustments to design, materials and coolants for future nuclear plant designs. Areas for collaboration include:

- establishment of the applicable phenomena and sources of experimental data;
- development and validation of new and extended models of plant behavior; and
- establishment of the validation basis and criteria for safety and design computer codes.

e. Advanced Reactor Systems

As the priorities for nuclear energy systems (such as safety, sustainability, security, cost estimates/financial analyses methods and models) evolve, new or adapted advanced reactor systems will be needed in the longer-term. New approaches such as small-output nuclear energy systems, or systems tailored to process steam or heat delivery, are already being considered internationally. Areas for collaboration to foster advanced reactor systems development include:

- identification of adaptations to current- and next-generation reactor types;
- definition and interpretation of fundamental requirements for future systems;
- development of common design codes and standards and design requirements; and
- research and development initiatives towards novel reactor designs or design features.

2. Sensitive Nuclear Technology, as defined by DOE regulations at Title 10 Code of Federal Regulations Part 810, is specifically excluded from bilateral research under this Implementing Arrangement.

Article 3 – Forms of Cooperation

Cooperation in accordance with this Implementing Arrangement may include:

1. 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 8;
2. Exchange of scientists, engineers, and other specialists for agreed periods of time in order to participate in experiments, analysis, design and other research and development activities at existing and new research centers, laboratories, engineering offices and other facilities and enterprises of each of the Participants or their respective associated organizations or contractors in accordance with Article 5;
3. Meetings of various forms to discuss and exchange information on scientific and technological aspects of general or specific subjects in the areas listed in Article 2, and to identify additional cooperative actions which may be usefully undertaken;
4. Exchange and provision of samples, materials, and equipment for experiments, testing and evaluation in accordance with Articles 6 and 7;

5. Execution of joint studies, projects or experiments including their joint design, construction and operation; and
6. Other specific forms of cooperation added by mutual written agreement of the Participants.

Article 4 - Management

1. Bilateral Committee

- a. The Participants agree to establish a bilateral I-NERI Committee ("BINERIC") to provide direction to and supervision of the executive agents of the Participants (collectively, the "Executive Agents"). The BINERIC will establish specific R&D scope and evaluation criteria through approval of the solicitations, select projects for award based on the recommendation of the Executive Agents, and determine annual project funding. The Participants will each select and appoint 2 to 4 representatives to serve on the BINERIC, each country being represented equally. Decisions of the BINERIC shall be made by consensus.
- b. The BINERIC shall establish rules and procedures on project selection, funding, meetings, expenses and other issues necessary for its operation and shall establish guidelines for the functioning of the Executive Agents.
- c. The BINERIC will coordinate its activities with the Lead Coordinators designated under Article 5 of the Energy R&D MOU.

2. Role of the Executive Agents

The Participants shall each select one Executive Agent and agree that the Executive Agents, acting under the direction and oversight of the BINERIC, will administer the I-NERI program activities as described below. The general duties of the Executive Agent are as follows:

- a. Prepare solicitations for proposals and criteria for proposal evaluation. Each solicitation and associated evaluation criteria will be subject to the BINERIC approval prior to issuance;
- b. Establish evaluation committees based on the BINERIC's instructions to execute peer review evaluations of proposals. The members of the evaluation committees shall be selected on the basis of technical competence, and free of any conflicts of

interest relating to the I-NERI program and/or the organizations involved in the proposals;

- c. Receive and screen all proposals for conformance to solicitation requirements, forward all conforming proposals to the evaluation committees for peer review, rank proposals in order of technical merit, and recommend proposals for awards to the BINERIC based on reports of the evaluation committees;
- d. Monitor project progress and make recommendations to the BINERIC for the following: authorization of funding for subsequent phases of multi-year phased projects, negotiation of programmatic modifications, and termination of a project if warranted by lack of reasonable progress against expenditures; and
- e. Prepare periodic status reports and distribute project reports to the BINERIC and to other I-NERI participants as appropriate.

Article 5 - Assignments and Exchanges of Personnel

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

- 1. Each Participant may, at its own expense, and subject to agreement of the other Participants, observe test activities and analytical work of the other Participants. Such observation may be accomplished by short-term visits or by the assignment of staff, subject to the prior agreement of the receiving Participant on each occasion.
- 2. Whenever an assignment or exchange of staff is contemplated under this Implementing Arrangement, each Participant involved in such assignment or exchange shall ensure the selection of qualified staff for assignment to the other Participants to conduct the activities planned under this Implementing Arrangement. Each such exchange of personnel shall be mutually agreed in advance by an exchange of letters between the Participants, referencing this Implementing Arrangement and its pertinent intellectual property provisions.
- 3. Each Participant shall be responsible for the salaries, insurance, and allowances to be paid to its staff or contractors.
- 4. Each Participant shall pay for the travel and living expenses of its staff while on assignment to the host Participant.

5. Each Participant shall assist in making arrangements for accommodations for the other Participants' assigned staff or contractors (and their families) on a mutually agreeable reciprocal basis.
6. The host Participant shall provide all necessary assistance to the assigned staff or contractors (and their families) of the other Participants regarding administrative formalities.
7. The staff and contractors of each Participant shall conform to the general and special rules of work and safety regulations in force at the host establishment.

Article 6 - Equipment

Unless otherwise agreed in writing, the following provisions shall apply to the provision of equipment by one Participant to the others, as applicable, under this Implementing Arrangement:

1. The sending Participant shall supply 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 Participant shall remain the property of the sending Participant and shall be returned to the sending Participant 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 or other utilities in accordance with all technical requirements which shall be as mutually agreed upon.
4. The sending Participant shall bear all expenses and risk of loss for shipment of equipment to the place of delivery of the receiving Participants. Upon receipt by the receiving Participants, the receiving Participants shall each bear risk of loss.
5. The equipment provided by the sending Participant for carrying out mutually agreed-upon activities shall be considered to be scientific, not having a commercial character.

Article 7 - Samples and Materials

Unless otherwise agreed in writing, the following provisions shall apply to the transportation and use of such samples and materials by one Participant to the others under this Implementing Arrangement:

1. All samples and materials provided by the sending Participant to any receiving Participant shall become the property of the respective receiving Participant upon delivery, and shall not be returned to the sending Participant, unless the receiving Participant elects otherwise in which case title shall not pass to the receiving Participant and any sample and/or materials in question shall be returned to the sending Participant upon the completion of the receiving Participant's use thereof.
2. Where one Participant requests that a sample or material be provided by another Participant, the Participant making the request shall bear all costs and expenses associated with the transportation of the sample or material from the location of the sending Participant to the final destination.
3. Each Participant shall promptly disclose to the other Participants all information arising from the examination or testing of samples or materials exchanged under this Implementing Arrangement. The Participants agree that business confidential information as defined in Article 8(4) which was developed prior to or outside the scope of this Implementing Arrangement, shall remain business confidential even though it may be contained in the results of an examination or testing of samples or materials. Such information shall be identified as business confidential by the Participant asserting its business confidential nature as soon as possible after disclosure is made by such Participant and the other Participants shall be immediately advised of that identification. All information identified as business confidential shall be controlled as provided under Article 8(4). It is further understood and agreed that one Participant providing samples or materials to another Participant 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 business confidential as defined in Article 8(4) and all such business confidential information is to be controlled as set out in Article 8(4).

Article 8 - Intellectual Property Rights

In conformity with the U.S.-Canada Agreement effected by exchange of notes at Ottawa, February 4, 1997, concerning Intellectual Property rights:

The Participants shall ensure adequate and effective protection of Intellectual Property created or furnished in the course of Cooperative Research activities conducted under this Implementing Arrangement. Rights to such Intellectual Property shall be allocated as set forth below:

1. Definitions

- a. For purposes of this Implementing Arrangement, "Intellectual Property" shall have the meaning found in Article 2 of the Convention establishing the World Intellectual Property Organization, done at Stockholm, July 14, 1967.
- b. "Cooperative Research" means any activity carried on under this Implementing Arrangement between any of the Participants.
- c. "Written Agreement" means an agreement between any of the Participants regarding a specific Cooperative Research activity which may incorporate the terms of this Implementing Arrangement.

2. Scope

- a. Any Intellectual Property created as a result of the Cooperative Research activities undertaken between any of the Participants shall be allocated according to the terms of this Article, unless otherwise specifically agreed by the Participants in writing.
- b. This Article addresses the allocation of rights, interests, and royalties between the Participants with respect to Cooperative Research conducted under this Implementing Arrangement. Each Participant that is involved in a Cooperative Research activity shall ensure that the other Participants can obtain the rights to Intellectual Property allocated in accordance with this Article. The Participants shall notify one another in a timely fashion of any Intellectual Property arising in the course of Cooperative Research and protect such Intellectual Property in a timely fashion. This Article does not otherwise alter or prejudice the allocation of Intellectual Property between a Participant and its nationals, which shall be determined by the laws and practices of that Participant's country.
- c. Disputes concerning Intellectual Property arising under this Implementing Arrangement shall be resolved in accordance with any applicable Written Agreements between the Participants, except that such Written Agreements shall not include provisions which call for binding arbitration. In the event that an applicable Written Agreement does not include a dispute resolution mechanism, disputes arising under such an arrangement shall be resolved through discussions between the involved Participants. Upon mutual agreement of such Participants, a dispute shall be submitted to an arbitral tribunal for binding arbitration. Unless such Participants agree otherwise in writing, the arbitration will be governed by the rules of UNCITRAL. From the date of receipt of an official request by a Participant for arbitration and pending resolution of the matter the Intellectual Property shall be jointly managed (i.e., Intellectual Property shall be jointly

maintained) by the Participants, but shall not be commercially exploited except by mutual agreement, in writing.

- d. Termination or expiration of this Implementing Arrangement shall not affect the validity or duration of Intellectual Property rights or obligations that arise while this Implementing Arrangement is in force.

3. Allocation of Rights

- a. Each Participant shall be entitled to a non-exclusive, irrevocable, royalty-free license in all countries to translate, reproduce, and publicly distribute scientific and technical journal articles, public reports, and books directly arising from Cooperative Research. Notwithstanding the preceding sentence, the Participants shall abide by requirements for publication of scientific journals and books, including publishers' rights, where appropriate, when doing so would promote dissemination of information. 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.
- b. Rights to all forms of Intellectual Property, other than those rights described in Article 8.3.a. above, shall be allocated as follows:
 - (1) Visiting researchers shall receive rights to Intellectual Property according to the policies of the host institution. In addition, each visiting researcher named as an inventor/creator of Intellectual Property shall be entitled to the same treatment as accorded a national of the host country who is a visiting researcher with regard to awards, bonuses, benefits, royalties or any other awards, in accordance with the policies and laws of the host institution.
 - (2) (a) For Intellectual Property created during joint research, when the Participants have agreed in advance on the scope of work, the Participants shall agree upon a Written Agreement concerning the protection and allocation of rights regarding Intellectual Property that may be created during such research, either prior to the start of their cooperative activity or within a reasonable time from the time a Participant becomes aware of the creation of Intellectual Property.

(b) In reaching agreement, the Participants shall consider the following factors: relative contributions of the Participants, the benefits of exclusive or non-exclusive licensing by territory or for field of use, requirements imposed by the Participants' domestic laws, and other factors deemed appropriate. The Written Agreement will normally address *inter alia*:

ownership and protection of background and foreground information, user rights for research and development purposes, exploitation and dissemination, including arrangements for joint publication, the rights and obligations of visiting researchers, the rules governing disclosure of undisclosed information, licensing and dispute settlement procedures.

(c) Notwithstanding the foregoing, in light of the Free Trade Agreement between the Governments of the United States and Canada, if the Participants cannot reach agreement on a Written Agreement within a reasonable time, not to exceed nine months from the time each Participant is made aware of the creation of the Intellectual Property, the Participants shall jointly seek protection for the Intellectual Property in both countries. Where applicable, each Participant shall control Intellectual Property in its territory and in all cases shall allow full market access to the other Participants to exploit their Intellectual Property rights in accordance with the factors listed in Article 8.3.b.(2)(b). Rights and interests in third countries shall be jointly determined.

- (3) In the event that any Participant believes that a particular joint research project under this Implementing Arrangement will lead to, or has led to, the creation of Intellectual Property of a type not protected by the applicable laws of one of the Participants, except in the case of copyright being unavailable for the works of the United States of America, the Participants 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 in writing by the Participants. If no agreement can be reached within a three-month period from the date of the request for discussions, the Participants shall cease the cooperation in the project in question. Notwithstanding Article 8.3.b.(2), rights to any Intellectual Property which has been created will be resolved in accordance with the provisions of Article 8.2.c.

4. Business-Confidential Information

In the event that information identified in a timely fashion as business-confidential is furnished or created under this Implementing Arrangement, each Participant shall protect such information in accordance with applicable laws, regulations and administrative practice. Information may be identified as business-confidential if a person having the information may derive an economic benefit from it or may obtain a competitive advantage over those who do not have it, the information is not generally known or publicly available from other sources, and the owner has not previously made the information available without imposing in a timely manner an obligation to keep it confidential. Without prior written consent, none of the Participants shall disclose any business-confidential information provided by any of the other Participants except to contractor

employees and government personnel authorized for this Implementing Arrangement. All such disclosures shall be for use only within the scope of their contracts or employment with the Participants relating to cooperation under this Implementing Arrangement. The Participants shall impose, or shall have imposed, an obligation on those receiving such information to keep it confidential. If one of the Participants 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 Participants. The Participants shall thereafter consult to define an appropriate course of action.

Article 9 – Subsidiary Agreements

When the Participants agree to undertake a form of cooperation pursuant to this Implementing Arrangement, the Participants will execute a written project annex. Each such project annex shall be subsidiary to this Implementing Agreement and shall include all detailed provisions for carrying out the specified forms of cooperation and shall cover such matters as technical scope, management, total costs, cost sharing and schedule.

Article 10 – General Provisions

1. Cooperation under this Implementing Arrangement shall be in accordance with the laws and regulations of Canada and the United States of America. All questions related to the Implementing Arrangement arising during its term shall be settled by the Participants by mutual agreement.
2. It is understood that this Implementing Arrangement does not constitute a treaty. The obligations described herein are binding and enforceable in accordance with the existing domestic laws of both countries.

Article 11 - Funding

1. Unless otherwise specifically agreed to in writing by the Participants, all costs resulting from collaboration under this Implementing Arrangement shall be borne by the Participant that incurs them. Each Participant shall carry out its obligations under this Implementing Arrangement subject to the availability of appropriated funds.
2. There is no obligation to make awards and commit funds for any projects in a given fiscal year.

Article 12 – Duration and Termination

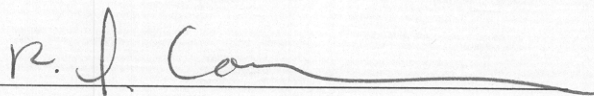
1. This Implementing Arrangement shall enter into force upon signature by all Participants and shall remain in force for five (5) years and shall be automatically extended for another five (5) years unless one of the Participants gives six (6) months advance written notification to the others of its intention to terminate the Implementing Arrangement at the end of its term.
2. This Implementing Arrangement may be amended by mutual written agreement of the Participants. This Implementing Arrangement may be terminated upon six (6) months advance notification in writing by any Participant. Such termination shall be without prejudice to any rights and interests which may have accrued under this Implementing Arrangement to any Participant up to the date of termination.
3. All joint efforts and experiments not completed at the expiration or termination of this Implementing Arrangement may be continued until their completion under the terms of this Implementing Arrangement.

Done in triplicate at Ottawa, this 17th day of June, 2003, in the English and French languages, each text being equally authentic.

FOR THE
DEPARTMENT OF ENERGY
OF THE UNITED STATES
OF AMERICA



FOR THE
DEPARTMENT OF NATURAL RESOURCES
OF CANADA



FOR ATOMIC ENERGY OF CANADA LIMITED

