No. 16841

UNITED STATES OF AMERICA
and
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

Arrangement between the United States Nuclear Regulatory Commission and the United Kingdom Atomic Energy Authority in the field of nuclear safety research and development (with addenda). Signed at Washington on 20 July 1977 and at London on 3 August 1977

Authentic text: English.
Registered by the United States of America on 10 July 1978.

ÉTATS-UNIS D'AMÉRIQUE
et
ROYAUME-UNI DE GRANDE-BRETAGNE ET D'IRLANDE DU NORD

Accord entre la Commission de réglementation nucléaire des États-Unis et l'Autorité de l'énergie atomique du Royaume-Uni dans le domaine de la recherche-développement sur la sécurité des réacteurs nucléaires (avec additifs). Signé à Washington le 20 juillet 1977 et à Londres le 3 août 1977

Texte authentique : anglais.
Enregistré par les États-Unis d'Amérique le 10 juillet 1978.

ARRANGEMENT[1] BETWEEN THE UNITED STATES NUCLEAR REGULATORY COMMISSION AND THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY IN THE FIELD OF NUCLEAR SAFETY RESEARCH AND DEVELOPMENT

The Contracting Parties,

Considering that the United States Nuclear Regulatory Commission (USNRC) and the United Kingdom Atomic Energy Authority (UKAEA)

(a) Have a mutual interest in cooperation in the field of nuclear safety information;

(b) Have previously exchanged research and development information in the field of fast reactors under the terms of an Arrangement that was originally signed on February 11, 1965, between the United States Atomic Energy Commission (USAEC) and the UKAEA, and continued as between the USNRC and the UKAEA after certain responsibilities of the USAEC were transferred to the USNRC on January 19, 1975, until terminated on July 20, 1976; and

(c) Wish to continue cooperation in the technology of fast reactor safety and to extend this to include safety aspects of thermal reactors;

Have agreed as follows:

Article I. OBJECTIVE

The USNRC and the UKAEA, in accordance with the provisions of this Arrangement and subject to applicable laws and regulations in force in their respective countries, shall establish cooperation between them in the field of nuclear safety research and development on the basis of mutual benefit and reasonable equality and reciprocity.

Article II. FORM OF COOPERATION

Cooperation in accordance with this Arrangement may take the following forms:

1. The exchange of technical information in the form of reports, experimental data, computer codes, correspondence, news letters and oral discussions.
2. The organization of meetings on specific agreed topics; such meetings normally to be held alternately in the US and UK for each topic.
3. Short visits by specialist teams or individuals to the facilities of the other Party.
4. Possible temporary assignment of personnel of one Party to the laboratory or facilities of the other Party, each such assignment to be considered on a case-by-case basis and be the subject of a separate attachment of staff agreement between the Parties.

[1] Came into force on 3 August 1977 by signature, in accordance with article IX (1).

5. The execution of joint programs and cooperative research projects, or those programs and projects under which activities are divided between both Parties, including the use of test facilities and/or computer programs owned or sponsored by either Party. Such joint programs and projects shall be agreed on a case-by-case basis and shall be the subject of separate agreements between the Parties.

6. The use by one Party of facilities owned or operated by the other Party. Such use of facilities shall be the subject of separate agreements between the Parties and may be subject to commercial terms and conditions.

7. If either Party wishes to visit, assign personnel or use the facilities owned or operated by government entities other than the Parties to this Arrangement, such governmental entities must give their prior written approval to the terms upon which such visit, assignment or use shall be made.

8. Any other form agreed between the Parties.

Article III. SCOPE OF INFORMATION EXCHANGE

1. The USNRC will make available to the UKAEA information in the field of nuclear safety research and development which it has the right to disclose, either in its possession or available to it, in the technical areas (listed in Addendum A) in which the USNRC is performing nuclear safety research.

2. The UKAEA will make available to the USNRC information in the field of nuclear safety research and development which it has the right to disclose, either in its possession or available to it, in the technical areas (listed in Addendum B) in which the UKAEA is performing nuclear safety research.

3. Each Party will promptly transmit and call to the other Party's attention any information on its research results appearing to have significant safety implications.

4. The Parties may also exchange information on any other topic by agreement.

5. Either Party may refuse to provide any particular information or information in general if that Party, in its absolute discretion, considers that the disclosure of such information might prejudice the national security, or otherwise be inimical to its national interest, or could be commercially damaging.

Article IV. ADMINISTRATION OF THE ARRANGEMENT

Each Party will designate as Administrator a senior representative to coordinate its participation in the overall exchange. A Review Meeting of the Administrators or their representatives will be held at agreed upon intervals to review the status of exchange and cooperation established under this Arrangement, to recommend revisions for improving and developing the cooperation, and to discuss topics within the scope of the cooperation. The time, place and agenda for such meetings shall be agreed upon in advance.

Article V. EXCHANGE AND USE OF INFORMATION

1. The Parties support the widest possible dissemination of information provided or exchanged under this Arrangement, subject to the need to protect proprietary information as may be exchanged hereunder, and to the provisions of Article VII, Patents.

2. As used in this Arrangement, the following definitions apply:

(i) The term "information" means scientific or technical data, results or methods of research and development, and any other information intended to be provided or exchanged under this Arrangement.

(ii) The term "proprietary information" means information which contains trade secrets or other information which is privileged or confidential, and may only include information which:

(a) Has been held in confidence by its owner; and

(b) Is of a type which is customarily held in confidence by its owner; and

(c) Has not been transmitted by the transmitting Party to other entities (including the receiving Party) except on the basis that it be held in confidence; and

(d) Is not otherwise available to the receiving Party from another source without restriction on its further dissemination.

3. The Party receiving proprietary information pursuant to this Arrangement shall respect the privileged nature thereof, provided such proprietary information is clearly marked with the appropriate legend of the transmitting party and with the following (or substantially similar) restrictive legend:

> "This document contains proprietary information furnished in confidence under an Arrangement dated . . . . . between the United States Nuclear Regulatory Commission and the United Kingdom Atomic Energy Authority and shall not be disseminated outside these organizations, their consultants, contractors, and licensees, and concerned departments and agencies of the Governments of the United States and the United Kingdom without the prior approval of . . . . . This notice shall be marked on any reproduction hereof, in whole or in part. These limitations shall automatically terminate when this information is disclosed by the owner without restriction."

4. In regard to the dissemination and use of proprietary information received in confidence under this Arrangement, the Parties agree that:

(i) Such information may be disseminated by the receiving Party to persons within or employed by the receiving Party, and to:

(a) Concerned Government departments and Government agencies in the country of the receiving Party;

(b) Prime or sub-contractors or consultants of the receiving party located within the geographical limits of the receiving party's nation, for use only within the framework of their contracts with the receiving Party in work relating to the subject matter of the proprietary information;

(c) Organizations permitted or licensed by the receiving Party in the field of development, design, construction and operation of nuclear production or utilization facilites for use only within the terms of such permit or license;

(d) Contractors of organizations identified in Item 4(i)*(c)* above for use only within the scope of the permit or license granted to such organizations,

provided that any proprietary information so disseminated under *(a), (b), (c)* and *(d)* above shall be on an as-needed, case-by-case basis, shall be pursuant to an

agreement of confidentiality and shall be marked with a restrictive legend substantially identical to that appearing in paragraph 3 above.

(ii) With the prior written consent of the Party providing proprietary information under this Arrangement, the receiving Party may disseminate such proprietary information more widely than otherwise permitted in the foregoing subsection (i). The Parties shall cooperate with each other in developing procedures for requesting and obtaining approval for such wider dissemination, and each Party will grant such approval to the extent permitted by its national policies, regulations, and laws.

(iii) Each Party shall exercise its best efforts to ensure that proprietary information received by it under this Arrangement is controlled as provided herein. If one of the Parties becomes aware that it will be, or may reasonably be expected to become, unable to meet the non-dissemination provisions of this Article, it shall immediately inform the other Party. The Parties shall thereafter consult to define an appropriate course of action.

(iv) Non-documentary proprietary information provided in seminars and other meetings organized under this Arrangement, or information arising from the attachments of staff, use of facilities or joint projects shall be treated by the Parties in accordance with the principles specified in this Article, provided, however, that the Party communicating such proprietary information places the recipient on notice as to the character of the information communicated.

(v) Nothing contained in this Arrangement shall preclude the use or dissemination of information received by a Party from sources outside of this Arrangement.

Article VI. COSTS

Except when otherwise specifically agreed upon by the Parties, all costs arising in the implementation of this Arrangement shall be borne by the Party that incurs them. It is understood that the ability of the Parties to carry out their obligations is subject to the availability of appropriated funds.

Article VII. PATENTS

1. With respect to any invention or discovery made or conceived in the course of or under this Arrangement:

(i) If made or conceived by personnel of one Party (the Assigning Party) or its contractors while assigned to the other Party (Recipient Party) or its contractors:

(a) The Recipient Party shall acquire all right, title, and interest in and to any such invention or discovery in its own country and in third countries, subject to a non-exclusive, irrevocable, royalty-free license in all such countries to the Assigning Party, with the right to grant sub-licenses, under any such invention or discovery and any patent application, patent or other protection relating thereto, for use in the production or utilization of special nuclear material or atomic energy; and

(b) The Assigning Party shall acquire all right, title, and interest in and to any such invention or discovery in its own country, subject to a non-exclusive, irrevocable, royalty-free license to the Recipient Party, with the right to grant sublicenses under any such invention or discovery and any patent application,

patent or other protection relating thereto for use in the production or utilization of special nuclear material or atomic energy.

(ii) If made or conceived by personnel other than the personnel referred to in paragraph (i) above, as a result of attendance at meetings or as a result of employing information which had been communicated under this Arrangement by one Party or its contractors to the other Party or its contractors, the Party of such personnel making the invention shall acquire all right, title, and interest in and to any such invention or discovery in all countries, subject to the grant to the other Party of a royalty-free, non-exclusive, irrevocable license, with the right to grant sublicenses, in and to any such invention or discovery and any patent application, patent or other protection relating thereto in all countries, for use in the production or utilization of special nuclear material or atomic energy.

(iii) With regard to other specific forms of cooperation, including loans or exchanges of materials, instruments and equipment for special joint research projects, the Parties shall provide for appropriate distribution of rights to inventions or discoveries resulting from such cooperation. In general, however, each Party should normally own the rights to such inventions or discoveries in its own country with a royalty-free, non-exclusive, irrevocable license to the other Party, and the rights to such inventions or discoveries in other countries should be agreed by the Parties on an equitable basis.

2. Neither Party shall discriminate against citizens of the country of the other Party with respect to granting any license or sublicense under any invention or discovery pursuant to paragraph 1 above. It is understood that the licensing policies and practices of each Party may be affected because of the rights of both Parties to grant licenses within a single jurisdiction. Accordingly, either Party may request, in regard to a single invention or discovery or class of inventions or discoveries, that the Parties consult in an effort to lessen or eliminate any detrimental effect that the parallel licensing authorities may have on the policies and practices of the Parties.

3. Each Party will assume the responsibility to pay awards or compensation required to be paid to its nationals according to the laws of its country.

Article VIII. DISCLAIMER

Information given by one Party to the other under this Arrangement shall 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 shall 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 IX. FINAL PROVISIONS

1. This Arrangement shall enter into force upon the later of the two dates on which it is signed and, subject to paragraph 2 of this Article, shall remain in force for a period of 5 years, unless previously extended by agreement between the Parties.

2. Either Party may withdraw from the present Arrangement after providing the other Party written notice 6 months prior to its intended date of withdrawal.

3. The Parties agree that all discussions, meetings, exchange of documents or other acts of cooperation between them since the termination of the

Arrangement of February 11, 1965, and prior to the entry into force of this Arrangement which, if they had occurred subsequent to the entry into force of this Arrangement, would have been subject to this Arrangement, shall be subject to the terms hereof.

For the United States
Nuclear Regulatory Commission:
By: [*Signed—Signé*] [1]
Title: Executive Director for Operations
Date: July 20, 1977

For the United Kingdom
Atomic Energy Authority:
By: [*Signed—Signé*] [2]
Title: Director, Safety and Reliability
Date: August 3rd, 1977

ADDENDUM A

USNRC-UKAEA Reactor Safety Research Exchange
Areas in which the USNRC is Performing Safety Research

1. Fast Reactors
   - 1.1 Molten Fuel-Coolant Interactions
   - 1.1 Post-Accident Heat Removal
   - 1.3 Accident Analysis, Delineation and Model Development
   - 1.4 Aerosol Generation Release and Transport
   - 1.5 Safety Test Facility Studies and Concept Development
   - 1.6 In-Pile Data Acquisition Methods Related to Experiment Diagnostics
   - 1.7 Analysis of Extended Core Motion in Core Disruptive Accidents
   - 1.8 Systems Integrity Studies
   - 1.9 All computer codes applicable to all the above at whatever state of development they may be *
   - 1.10 Data from all experiments applicable to the above *
2. Water Reactors
   - 2.1 Primary Coolant System Rupture Studies
   - 2.2 Heavy Section Steel Technology Program
   - 2.3 LOFT program
   - 2.4 Power Burst Facility—Subassembly Testing Program
   - 2.5 Separate Effects Testing—Loss of Coolant Accident Studies
   - 2.6 Loss of Coolant Accident Analyses—Analytical Model Development
   - 2.7 Design Criteria for Piping, Pumps, and Valves
   - 2.8 Alternate ECCS Studies
   - 2.9 Core Meltdown Studies
   - 2.10 Fission Product Release and Transport Studies

* It is understood that if data or computer codes are requested by the UKAEA in an incomplete form, USNRC effort might not be available to assist with interpretation, completion or operating difficulties.

[1] Signed by Lee V. Gossick—Signé par Lee V. Gossick.
[2] Signed by G. H. Kinchin—Signé par G. H. Kinchin.

2.11 Probabilistic Studies

2.12 Zirconium Damage

2.13 All computer codes applicable to all the above at whatever stage of development they may be *

2.14 Data from all experiments applicable to the above *

3. Gas-Gooled Reactors

4. Nuclear Material Transport, Disposal and Environmental Effects

ADDENDUM B

UKAEA-USNRC Reactor Safety Research Exchange
Areas in which the UKAEA is Performing Safety Research

I. Fast Reactor Safety Research

1. Escalation of sub-assembly faults to whole-core accidents

1.1 Fuel failure studies

A. Models of fuel failure under accident conditions

B. Analysis of fuel failure experiments

C. System transient analysis

1.2 Sodium boiling

A. Basic studies (bubble growth and collapse, etc.)

B. Multi-pin testings in water and sodium

C. Analysis of multi-pin tests

1.3 Reliability and accuracy of sub-assembly fault detection

A. Boiling noise

B. Burst pin (delayed neutron, fission product gas)

C. Coolant temperature noise

D. Reactivity variation

E. Monitoring systems development

(pulse-coded guard lines, computer-assisted safety systems)

2. Containment of hypothetical whole core accidents

2.1 Calculation of reactivity ramp rates

A. Fuel coolant interaction in sub-assemblies

B. Core integrity following a sub-assembly explosion

C. Nuclear excursion calculations (FRAX code)

D. Equation of state of core materials

E. Effect of fuel coolant interaction immediately after whole core accident ("Q" **)

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2.2 Demonstration of ability of primary containment to resist loadings imposed by a whole core accident

A. Supporting tests and structure analysis (high strain rates, etc.)

B. Explosion tests on model and containment code validation experiments

C. Core support, roof and vessel loading calculations

D. Post-expansion core behavior analysis (catch, pots, decay heat removal, etc.)

3. Miscellaneous

3.1 Fire characteristics, detection and suppression

3.2 Reliability and fault analysis including reliability and accuracy of leak detectors, rupture discs, etc.

3.3 Fuel handling fault analysis

4. All computer codes applicable to all the above at whatever stage of development they may be *

5. Data from all experiments applicable to the above *

II. Water Reactor Safety Research

1. Reactor Physics calculation methods and codes, e.g., nuclear/thermal/hydraulic transient analysis, shutdown reactivity predictions, shielding and gamma heating codes

2. Loss-of-Coolant Accident Analysis } Analytical methods
3. ECCS studies } Experimental studies

4. Fuel behavior in fault transients, fuel safety criteria

5. Pressure tube integrity

6. Steam drum integrity

7. Radioactive corrosion products—production and deposition in coolant circuit

8. Decontamination processes for coolant circuit

9. Active effluent treatment

10. All computer codes applicable to all the above at whatever stage of development they may be *

11. Data from all experiments applicable to the above *

III. Gas Cooled Reactors

IV. Nuclear Material Transport, Disposal and Environmental Effects

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* It is understood that if data or computer codes are requested by the USNRC in an incomplete form, UKAEA effort might not be available to assist with interpretation, completion or operating difficulties.