ANNEX IV TO THE IMPLEMENTING ARRANGEMENT

BETWEEN THE JAPAN ATOMIC ENERGY RESEARCH INSTITUTE

AND THE UNITED STATES DEPARTMENT OF ENERGY

ON COOPERATION IN FUSION RESEARCH AND DEVELOPMENT

FOR THE

DOE-JAERI COLLABORATIVE PROGRAM

ON TECHNOLOGY FOR FUSION-FUEL PROCESSING

1. INTRODUCTION AND TERMS OF REFERENCE

Whereas Article III.2 of the Implementing Arrangement between the United States Department of Energy (hereinafter referred to as "DOE") and the Japan Atomic Energy Research Institute (hereinafter referred to as "JAERI") on Cooperation in Fusion Research and Development of November 8, 1983, (hereinafter referred to as "the Implementing Arrangement") provides for additional activities through written annexes to the Implementing Arrangement,

Whereas DOE and JAERI have a Collaborative Program under way for the development of improved components for the Fuel Cleanup System of the Tritium Systems Test Assembly (TSTA), at the Los Alamos National Laboratory (LANL), Los Alamos, New Mexico, as Annex III to the Implementing Arrangement, signed November 10, 1986,

Whereas DOE and JAERI are both interested in establishing broader collaboration in tritium handling and processing technology for the peaceful uses of fusion energy, including JAERI participation in TSTA in the near-term and as appropriate DOE participation in a future JAERI tritium facility in the longer term,

DOE and JAERI (hereinafter also referred to as "the Parties") agree to the following detailed provisions in a Collaborative Program to develop technology for fusion-fuel processing (hereinafter referred to as the "Fusion-Fuel Program"), in accordance with the provisions of the Implementing Arrangement, as follows:

2. OBJECTIVE

The objective of the Fusion-Fuel Program is to design, conduct, and evaluate the joint operation and experiments on fusion fuel technology with the TSTA at LANL for the purposes of

a. developing and demonstrating fuel processing technology for fusion power systems;

b. developing and testing environmental and personnel protective systems for tritium handling;

c. developing, testing, and qualifying equipment and material for tritium service in the fusion energy program;

d. operating systems that can become the basis for tritium systems for advanced fusion machines such as an ignition experiment, an engineering test facility, or a reactor;

e. demonstrating reliability of components; and

f. demonstrating safe handling of tritium.

3. FUSION-FUEL PROGRAM

3.1 The TSTA facility contains a working prototype of a fuel processing system for a fusion reactor. This fuel processing system consists of a torus vacuum vessel, a vacuum cryopumping system, systems for fuel cleanup and separation of hydrogen isotopes, waste treatment and cleanup systems, and associated storage, delivery, and transfer pumping systems. The maximum flow rate in the fuel processing system is 360 moles of deuterium-tritium per day and requires a tritium inventory of approximately 120 grams.

The Fusion-Fuel Program shall be one of several users of the TSTA facility; the TSTA facility shall not be dedicated exclusively to the Fusion-Fuel Program. DOE shall arrange the planning and scheduling of experiments under this Fusion-Fuel Program, in accordance with the directives of the Steering Committee established in Article 4 of this Annex.

3.2 The Fusion-Fuel Program shall consist of

a. exchange of personnel and information necessary to carry out the Fusion-Fuel Program;

b. joint planning and design of experiments and joint fabrication of components necessary to conduct experiments at the TSTA facility;

c. joint scheduling of the operation of the fuel processing system at normal and off-normal conditions;

d. joint conduct of experiments at the TSTA facility;

e. pre- and post-experiment analysis and evaluation; and

f. exchange of results arising from the Fusion-Fuel Program.

3.3 The Fusion-Fuel Program shall consist of two phases

3.3.1 In the first phase, DOE shall operate the TSTA fuel processing system in order to demonstrate the technology for the deuterium-tritium fuel cycle. In addition, experiments shall be performed both in the processing system and outside the processing system as necessary to meet the objective of the Fusion-Fuel Program. Upon the initiation of the Fusion-Fuel Program, DOE and JAERI shall develop a test plan for the first three years of the agreement. This test plan shall be reviewed by DOE and JAERI annually. At the completion of this test plan, DOE and JAERI, by mutual agreement, shall develop a new test plan if necessary to conduct any further testing during the first phase of the existing fuel processing system and related experiments needed to meet the objective of the Fusion-Fuel Program.

3.3.2 In the second phase, DOE and JAERI by mutual agreement shall identify, develop, and implement useful upgrades to the existing TSTA fuel processing system. As part of the upgrade, JAERI plans to design, develop, fabricate, and ship to TSTA a complete new Fuel Cleanup System (FCU) based on the results of the Collaborative Program under Annex III to the Implementing Arrangement. DOE and JAERI shall develop a new test plan for TSTA for the second phase that shall identify operational tests for the fuel processing system which may include the FCU as well as additional experiments to be performed outside of the fuel processing system.

3.4 DOE responsibilities shall include

a. performance, analysis, and evaluation of its experiments which include but are not limited to development and preparation of instruments, performance of measurements, data collection, and data processing.

b. control over all operations of the TSTA facility and over all of its systems and components.

c. support its share of the costs as determined by the Steering Committee.

3.5 JAERI responsibilities shall include

a. performance, analysis, and evaluation of its experiments which include but are not limited to development and preparation of instruments, performance of measurements, data collection, and data processing.

b. support its share of the costs as determined by the Steering Committee.

c. in the second phase of the Fusion-Fuel Program, if JAERI builds a new FCU, then JAERI is responsible for all costs involved with the design, development, fabrication, and shipment of the new FCU to the TSTA facility.

3.6 Funding of the Fusion-Fuel Program covering the operation of and experiments conducted at the TSTA facility is expected to be at a level of approximately 4 million U.S. dollars (FY87 dollars) per year.

4. MANAGEMENT

4.1 The Parties agree to establish a Steering Committee.

4.2 The Steering Committee shall be responsible for management of the Fusion-Fuel Program.

4.3 The Steering Committee shall be composed of four members, two each to be assigned by DOE and JAERI.

4.3.1 DOE and JAERI each shall identify a person to serve as co-chairman of the Steering Committee. All communication shall be channeled through these co-chairmen or their designees.

4.3.2 DOE and JAERI shall designate appropriate alternates who shall serve if the co-chairmen are unable to do so. Each shall inform the other in writing of all such designations. DOE and JAERI shall each have one vote in the Steering Committee, and all decisions shall be by unanimity. The Steering Committee shall be chaired by the host country of the Steering Committee meeting.

4.4 The Steering Committee shall meet annually at LANL or on a date and location mutually agreed upon by the co-chairmen. An exchange of correspondence may substitute for a meeting of the Steering Committee.

4.5 The functions of the Steering Committee shall include

a. planning the Fusion-Fuel Program and developing the annual work plan which shall include the proposed annual budget and the financial contributions of DOE and JAERI; recommending the annual program of work, budget, and personnel assignments and other such matters to DOE and JAERI for approval;

b. reviewing the technical progress of the Fusion-Fuel Program and the operation of and the experiments at the TSTA facility;

c. arranging for personnel exchanges and assignments;

d. reviewing plans for publications;

e. reviewing the costs and the projection of expenditures;

f. deciding the experiments to be started, completed, or continued;

g. changing the Fusion-Fuel Program as necessary to fit the programmatic needs of either party;

h. evaluating periodically the relevance of the Fusion-Fuel Program to both the DOE and JAERI fusion programs;

i. reporting to the United States (U.S.)/Japan Coordinating Committee on Fusion Energy, established in the Exchange of Notes between the Government of the U.S. and the Government of Japan dated August 24, 1979, through Contact Persons, as described in the Exchange of Letters between the Science and Technology Agency of Japan and the DOE on January 25, 1983, on the review of technical progress, the recommendation of future plans, budgets and the financial contribution of DOE and JAERI to the Fusion-Fuel Program of the annual program of work, and

j. discussing other matters as mutually agreed.

5. FINANCE

5.1 The Steering Committee shall determine on an annual basis the financial contributions of both DOE and JAERI. For the first year (JFY87), JAERI shall provide to DOE 2 million U.S. dollars.

5.2 JAERI shall provide to DOE the agreed upon financial contribution in U.S. dollars which lump sum shall be paid on or before July 31 of each calendar year in compliance with an invoice which shall be sent to JAERI on or before June 30. JAERI shall arrange to make payment in U.S. dollars in accordance with instructions provided by DOE.

5.3 In January of each year, DOE shall provide to JAERI a projection of expenditures for the Fusion-Fuel Program for the next U.S. fiscal year.

5.4 DOE shall provide annually to JAERI an accounting of expenditures related to the Fusion-Fuel Program for the previous U.S. fiscal year.

5.5 The ability of DOE and JAERI to carry out their obligations under the Fusion-Fuel Program including a new FCU during the second phase is subject to the availability of appropriated funds. If at any time DOE or JAERI is unable to provide its financial contribution, neither DOE nor JAERI shall be obligated to continue to expend any funds for the Fusion-Fuel Program.

6. INFORMATION AND PATENTS

6.1 The Parties shall exchange information necessary to carry out the Fusion-Fuel Program and all information arising from the Fusion-Fuel Program shall be so identified and promptly exchanged between DOE and

JAERI. It is understood, however, there shall normally be no obligation to exchange design and development information such as detail fabrication drawings, fabrication methods and specifications, and related information that was generated prior to the initiation of the Fusion-Fuel Program.

6.2 The application or use of any information provided under or arising from the Fusion-Fuel Program shall be the responsibility of the Party receiving it, and the other Party does not warrant the suitability of such information for any particular use or application.

6.3 The information provided under and arising from the Fusion-Fuel Program may be made available to the public by either Party through customary channels and in accordance with the normal procedures of the Parties, subject to the provisions of subparagraphs 6.5-6.8 below.

6.4 Copyrights of the Parties shall be accorded treatment consistent with internationally recognized standards of protection. As to copyrights on materials within the scope of paragraph 1 of Article IV of the Implementing Arrangement owned or controlled by a Party, that Party shall make efforts to grant to the other Party a license to reproduce or translate copyrighted material.

6.5 Proprietary information shall not be accepted for or utilized in the Fusion-Fuel Program without the written approval of DOE and JAERI. For the purposes of the Fusion-Fuel Program, proprietary information shall mean information of a confidential nature acquired prior to or outside the scope of the Fusion-Fuel Program such as trade secrets and know-how (e.g., computer programs, design procedures and techniques, drawings, chemical composition of materials or manufacturing methods, processes and treatments) which is appropriately marked, provided such information: (a) has been held in confidence by its owner, (b) is of a type which is customarily held in confidence by its owner, (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. It shall be the responsibility of the Party supplying proprietary information to identify the information as such and to ensure that it is appropriately marked.

6.6 Inventions or discoveries made or conceived in the course of or under the Fusion-Fuel Program of this Annex (hereinafter referred to as "arising inventions") shall be identified by the Inventing Party and shall be reported promptly to the other Party. Information regarding arising inventions on which patent protection is to be obtained shall not be published or publicly disclosed by the Parties until a patent application has been filed in either country of the Parties, provided, however, that this restriction on publication or disclosure shall not extend beyond six months from the date of reporting of the arising invention. It shall be the responsibility of the Inventing Party to appropriately mark reports which disclose arising inventions that have not been appropriately protected by the filing of a patent application.

6.7 Arising inventions shall be owned (a) by JAERI in Japan subject to a royalty-free, nonexclusive, irrevocable license to DOE, its Government, and the nationals of its country designated by it and (b) by DOE in the U.S. and third countries subject to a royalty-free, nonexclusive, irrevocable license to JAERI, its Government, and the nationals of its country designated by it.

6.8 The provisions of Article 6.6, 6.7, and 6.9 shall apply mutatis mutandis to the protection of utility models and designs.

6.9 Each Party shall, without prejudice to any rights of inventors or authors under its national laws, take all necessary steps to provide the cooperation from its inventors or authors required to carry out the provisions of this Article. Each Party shall assume the responsibility to pay awards or compensation required to be paid to its own nationals according to its own laws.

7. ASSIGNMENT OF PERSONNEL

JAERI may assign up to but no more than four JAERI scientific or technical personnel at any one time to TSTA. Additional JAERI personnel can be assigned if required only by mutual agreement of DOE and JAERI. The total annual assignment of personnel shall not exceed four man-years unless mutually agreed upon by DOE and JAERI. This exchange of personnel shall be in accordance with Article IX of the Implementing Arrangement.

8. LOAN OF COMPONENTS, EQUIPMENT, INSTRUMENTS, MATERIAL, AND SPARE PARTS

8.1 Any exchanges, loan or supply of components, equipment, instruments, material, or spare parts under the Fusion-Fuel Program shall be conducted in accordance with Article X of the Implementing Arrangement.

8.2 JAERI is responsible for the shipment of their components, equipment, instruments, material, and spare parts to the TSTA facility at LANL. DOE shall accept responsibility for the protection and operation of these components, equipment, instruments, material, and spare parts after they have passed LANL inspection upon arrival at the TSTA facility.

8.3 Components, equipment, instruments, material, or spare parts provided by JAERI under this Annex shall, in principle, be returned to JAERI unless necessary decontamination cannot be performed. In such a case, contaminated items shall be disposed of by DOE, if and when JAERI abandons the right of possession, and the cost of such disposal shall, in principle, be borne by JAERI. For all items returned to JAERI, the cost of decontamination, if any, and of transport shall, in principle, be borne by JAERI. Final disposition of all components, equipment, instruments, material, and spare parts used in the Fusion-Fuel Program shall be carried out in accordance with recommendations of the Steering Committee and mutual agreement of DOE and JAERI. For the duration of the Fusion-Fuel Program, components, equipment, instruments, material, and spare parts provided by JAERI shall be considered to be the property of the Government of Japan.

8.4 Each such exchange shall be the subject of a separate loan agreement if necessary.

9. INCORPORATION BY REFERENCE

Such other terms and conditions that are not described in this Annex shall be subject to Articles IV, V, VI, VII, VIII, IX, X, and XI of the Implementing Arrangement.

10. DURATION AND TERMINATION

The Fusion-Fuel Program shall enter into force upon signature of this Annex by DOE and JAERI and shall remain in force for a period of five (5) years. The Fusion-Fuel Program may be renewed or amended by written agreement between DOE and JAERI. The Fusion-Fuel Program may be terminated at the discretion of either DOE or JAERI upon six (6) months advance notice in writing by the side seeking to terminate the Fusion-Fuel Program. Such termination shall be without prejudice to the rights which may have accrued under the Fusion-Fuel Program to either Party up to the date of such termination. Specific activities initiated hereunder but not completed at the termination of this Annex may be continued until their completion under the terms of this Annex.

In Witness whereof, this Annex has been signed in duplicate in the English and Japanese language, both being equally authentic.

for THE UNITED STATES
DEPARTMENT OF ENERGY

John Clarke

John F. Clarke
Associate Director for Fusion Energy
Office of Energy Research

done on
June 11, 1987

for THE JAPAN ATOMIC ENERGY
RESEARCH INSTITUTE

Yoshinori Ihara

Yoshinori Ihara
President

done on
June 11, 1987