

**ANNEX X 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 A TV THOMSON SCATTERING SYSTEM
FOR JFT-2M**

1. INTRODUCTION AND TERMS OF REFERENCE

Whereas the United States Department of Energy (hereinafter referred to as "DOE") and the Japan Atomic Energy Research Institute (hereinafter referred to as "JAERI") have a continuing program of joint planning on a variety of tokamak physics issues such as current drive, edge plasma physics, equilibrium, stability, and transport,

Whereas Article III.2 of the Implementing Arrangement between DOE and 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 JFT-2M, operated by JAERI at its Tokai Research Establishment, is a flexible device capable of studying many of the important scientific issues in tokamak research,

Whereas DOE has supported the development, design, fabrication, and operation of several TV Thomson scattering systems at the Princeton Plasma Physics Laboratory, a laboratory operated under DOE contract (hereinafter referred to as "PPPL"),

Whereas DOE and JAERI are interested in the experimental application of TV Thomson scattering systems, which will work with either ruby laser or frequency-doubled YAG lasers, for tokamak physics studies,

DOE and JAERI (hereinafter referred to as "the Parties") agree in accordance with the provision of the Implementing Arrangement, as follows:

2. OBJECTIVE

The objective of the Collaborative Program is to utilize the expertise and facilities of PPPL to develop, design and fabricate the optical portion of a TV Thomson scattering system for JFT-2M in order to provide improved data for tokamak physics studies.

3. COLLABORATIVE PROGRAM

3.1 The Collaborative Program shall consist of:

- a. Joint design of a TV Thomson scattering system for JFT-2M to consist of an optical subsystem (collecting optics, fiber optics, and spectrometer), an electro-optical subsystem (image intensifiers and CCD), control and data acquisition subsystem (camera controller, laser controller, CAMAC, and computer), vacuum components subsystem (viewing window, shutter, laser dump, viewing dump, laser window and beam tube, and alignment probe), laser subsystem, and software subsystem.
 - b. joint development of improved TV Thomson scattering system optics and of an electro-optical detector suitable for the JFT-2M TV Thomson scattering system and as a replacement for the Tokamak Fusion Test Reactor (TFTR) and Princeton Beta Experiment (PBX) TV Thomson scattering systems,
 - c. fabrication and installation of the TV Thomson scattering system on JFT-2M,
 - d. joint testing of the TV Thomson scattering system on JFT-2M,
 - e. exchange of personnel and information necessary to carry out the Collaborative Program, and
 - f. the exchange of results arising from the Collaborative Program within the period of the annex.
- 3.2 DOE shall:
- a. through PPPL, design, build, and test the optical portion (subsystem) of a multi-point TV Thomson scattering system suitable for JFT-2M, in consultation with JAERI;
 - b. through PPPL, develop an electro-optical detector subsystem suitable both for the JFT-2M TV Thomson scattering system and as a replacement for the TFTR and PBX TV Thomson scattering systems and provide a detector and a spare to JAERI;
 - c. through PPPL, send a representative to JAERI for a suitable time to provide advice and assistance to interface the subsystems provided by PPPL to the remainder of the system provided by JAERI and to JFT-2M; and
 - d. host one or more representatives from the JAERI at PPPL for a suitable period, so that they can become familiar with the PPPL TV Thomson scattering systems.
- 3.3 JAERI shall:
- a. pay the costs for the detailed design, fabrication, and installation of the portions of the TV Thomson scattering system provided by PPPL and pay for one-half of the manpower costs for the development of the portions of the system developed by PPPL;
 - b. host PPPL representatives as necessary for them to consult with and assist JAERI in the design and interfacing of the subsystem; and
 - c. provide technical data, drawings, and photographs of JFT-2M as needed.
- 3.4 DOE and JAERI shall:

- a. plan and carry out joint tests of the TV Thomson scattering system after it is installed on JFT-2M; and
- b. share information about the performance of TV Thomson scattering systems at PPPL and JFT-2M.

4. MANAGEMENT

- 4.1 The management of the Collaborative Program shall be carried out by a Steering Committee.
- 4.2 The Steering Committee shall be composed of four members, two each to be assigned by DOE and JAERI. The Steering Committee shall have the functions as described in Paragraph 4.5 below.
 - 4.2.1 DOE and JAERI shall each identify a person to serve as co-chairman of the Steering Committee. Official communications shall be channelled through these co-chairman or their designees.
 - 4.2.2 DOE and JAERI shall designate an appropriate alternate who shall serve if a member is 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.
- 4.3 The Steering Committee shall meet annually, or as required, on a date and at a location mutually agreed upon. An exchange of letters may serve as a substitute for a meeting of the Steering Committee.
- 4.4 The detailed annual work plan shall be developed by the project managers, one at PPPL selected by PPPL and one at JFT-2M selected by JAERI.
 - 4.4.1 The JFT-2M project manager shall have overall responsibility for the project, including systems integration.
 - 4.4.2. The PPPL project manager shall have responsibility for the work performed by PPPL.
 - 4.4.3 The project managers shall meet as required to manage the Collaborative Program and shall report as required to the Steering Committee.
- 4.5 The functions of the Steering Committee shall include:
 - a. reviewing the annual work plan developed by the project managers;
 - b. reviewing progress of the Collaborative Program;
 - c. reporting to the US-Japan Coordinating Committee on Fusion Energy through contact persons described in Article I of the Exchange of Letters between the

Science and Technology Agency of Japan and DOE on January 25, 1983; and

- d. discussing other matters as necessary for the conduct of the Collaborative Program.

5. FINANCE

JAERI shall reimburse DOE for the costs of the detailed design and fabrication of the optical and electro-optical detector subsystems of the TV Thomson scattering system for JFT-2M, the costs of shipping these subsystems to the Tokai site of JAERI, the costs of participating in the installation of the TV Thomson scattering system on JFT-2M, and one-half of the cost of the manpower for the development of the subsystems. DOE shall provide one-half of the cost of the manpower for the development of the optical and electro-optical detector subsystems.

6. INFORMATION AND PATENTS

- 6.1 DOE shall provide JAERI with necessary information to install, operate, and maintain the optical and electro-optical subsystems provided by PPPL. This information shall include design information such as fabrication drawings for the PPPL fabricated subsystems. This information shall be non-proprietary and shall not include detailed manufacturing know-how.
- 6.2 JAERI shall provide DOE with necessary information on the JFT-2M facility and the JAERI provided subsystems of the TV Thomson scattering system to design, fabricate, and assist in the installation of the PPPL provided subsystems. This information shall be non-proprietary and shall not include detailed manufacturing know-how.
- 6.3 Each Party shall provide promptly to the other Party all information resulting from the Collaborative Program pertaining to the TV Thomson scattering system and its operation.
- 6.4 The information provided under and arising from the Collaborative 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 paragraphs 6.5-6.8.
- 6.5 Proprietary information shall not be accepted for or utilized in the Collaborative Program without the written approval of Transmitting Party. For the purpose of the Collaborative program, proprietary information shall mean information developed outside of this agreement of a confidential nature such as trade secrets and know-how (e.g., computer programs, design procedures and techniques, 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 is to 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 as to ensure that it is appropriately marked.

- 6.6 Inventions or discoveries made or conceived in the course of or under the Collaborative Program (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 inventions. 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 and third countries 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 United States subject to a royalty-free, nonexclusive, irrevocable license to JAERI, its Government, and the nationals of its countries designated by it.
- 6.8 This Article shall apply mutatis mutandis to the protection of utility models and of design.
- 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

DOE and JAERI may assign one or more persons to the other Party for a total duration as technically required. The co-chairmen shall determine the duration of the assignment(s) before the assignment(s) begin(s). Assignments of personnel shall be made in accordance with Article IX of the Implementing Arrangement. Each such assignment of personnel shall be the subject of a separate assignment agreement.

8. EXCHANGE OF COMPONENTS, EQUIPMENT, INSTRUMENTS, AND MATERIAL

DOE is responsible for the shipment of the optical and electro-optical subsystems of the TV Thomson scattering system. JAERI shall accept responsibility for the protection,

assembling, installation of these subsystems on JFT-2M and operation of these subsystems after they have passed inspection upon arrival at the Tokai site. The subsystems of the TV Thomson scattering system fabricated by PPPL for JFT-2M shall become the property of JAERI. Any exchanges, loans, or supply of other components, equipment, or instruments under the Collaborative Program shall be conducted in accordance with Paragraphs 1, 2, 3, 4, 5, and 7 of Article X of the Implementing Arrangement. DOE shall be responsible for the transportation of all other components, equipment, or instruments to and from the Tokai Research Establishment of JAERI. For the duration of the Collaborative Program, all components, equipment, and instruments provided by DOE, other than the TV Thomson scattering subsystems, shall be considered to be the property of the U.S. Government.

9. INCORPORATION BY REFERENCE

Articles V, VII, and VIII of the Implementing Arrangement are applicable to the Collaborative Program.

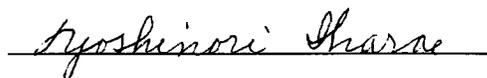
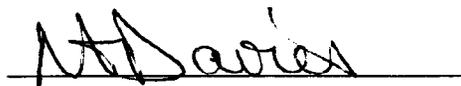
10. DURATION AND TERMINATION

The Collaborative Program shall enter into force upon signature of this Annex by DOE and JAERI and shall remain in force for a period of two (2) years or until termination of the Implementing Arrangement, whichever occurs first. This Annex may be renewed or amended by written agreement between DOE and JAERI. The Collaborative Program may be terminated at the discretion of either DOE or JAERI upon six months advance notice in writing by the side seeking termination. Such termination shall be without prejudice to the rights which may have accrued under the Collaborative 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 language.

for THE UNITED STATES
DEPARTMENT OF ENERGY

for THE JAPAN ATOMIC ENERGY
RESEARCH INSTITUTE

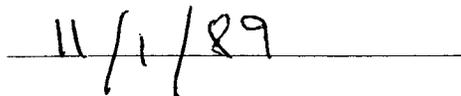


N. Anne Davies
Acting Associate Director for
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Yoshinori Ihara
President

Date

Date



October 25, 1989