

**ANNEX VIII 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 THE TESTING OF A NEGATIVE ION SOURCE
FOR NEUTRAL BEAM INJECTORS**

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 cooperated on the development of high power negative ion neutral beam plasma heating technology,

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 DOE and JAERI wish to advance the application of negative ion sources for heating and current drive of plasmas and identify the technical characteristics of the next generation neutral beam injector,

Whereas DOE has an experimental test facility at the Lawrence Berkeley Laboratory (hereinafter referred to as "LBL") that can perform the required negative ion source tests and JAERI has developed a one ampere negative ion source,

DOE and JAERI (hereinafter referred to as the "Parties") agree to a program of collaborative activities to test a negative ion source for neutral beam injectors (hereinafter referred to as the "Collaborative Program") in accordance with the provisions of the Implementing Arrangement as follows;

2. OBJECTIVE

The objective of the Collaborative Program is to perform joint experiments using the test facilities at LBL to optimize the production of deuterium negative ions using a one ampere negative ion source designed and manufactured by JAERI, which would be applicable to the next generation of fusion experimental devices.

3. COLLABORATIVE PROGRAM

3.1 The Collaborative Program shall consist of:

- (a) planning the experiments to test the JAERI negative ion sources;
- (b) provision of a negative ion source by JAERI;
- (c) installation and testing of the ion source at LBL;
- (d) optimization of deuterium negative ion production through the conduct of joint experiments at LBL;
- (e) exchange of personnel and information necessary to carry out the Collaborative Program.

3.2 The experiments under the Collaborative Program shall be carried out on the ion source test facility at LBL (hereinafter referred to as the "LBL Test Facility") during the first six months of calendar year 1989.

3.3 The responsibilities of the Parties in the Collaborative Program are as follows:

3.3.1 JAERI shall:

- (a) Test a negative ion source using hydrogen and provide the source whose physical dimensions are compatible with the LBL Test Facility.
- (b) Provide LBL, as agreed by the Parties, with instruments, repair parts, and information which are necessary to operate and maintain the ion source.
- (c) Assign personnel to LBL for a duration as agreed by the Parties. The assignee(s) shall aid in the assembly, installation, and operation of the ion source and shall join in the planning and conduct of the experiments for the duration of the assignment.

3.3.2 DOE shall:

- (a) Provide JAERI with necessary information to install and operate the JAERI negative ion source.
- (b) Assemble and install the JAERI negative ion source aided by JAERI's assignee(s).
- (c) Operate the JAERI negative ion source in deuterium aided by JAERI's assignee(s).
- (d) Maintain the JAERI negative ion source aided by JAERI's assignee(s).

- (e) Install necessary instruments and repair parts provided by JAERI.

3.3.3 DOE and JAERI shall:

- (a) Jointly develop the experimental plans and conduct the experiments in the LBL Test Facility.
- (b) Evaluate the results of the experiments in order to establish the design bases of the next generation neutral beam injector.

4. MANAGEMENT

- 4.1 A Steering Committee shall be established by the Parties and be responsible for management of the Collaborative Program.
- 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 4.4 below.
 - 4.2.1 DOE and JAERI each shall identify a person to serve as co-chairman of the Steering Committee. Official communications shall be channeled through these co-chairmen 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, and 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 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 functions of the Steering Committee shall include:
 - (a) planning of the Collaborative Program;
 - (b) reviewing progress in preparation for, and during conduct of, the experiment;
 - (c) evaluating the results of the experiment at its end;
 - (d) 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;

- (e) reaching agreement on the assignee(s) to LBL; and
- (f) discussing other matters necessary for conduct of the Collaborative Program.

In addition to these functions, the Steering Committee shall be responsible for periodically evaluating the Collaborative Program's relevance to both the DOE and JAERI fusion programs and shall report these evaluations as needed to the US-Japan Coordinating Committee on Fusion Energy.

5. FINANCE

Except when otherwise mutually agreed in writing, each Party shall bear the costs of its activities in accordance with its responsibilities as described in this Annex. The activities to be conducted under this Annex shall be subject to the availability of appropriated funds in each country.

6. INFORMATION AND PATENTS

- 6.1 DOE shall provide JAERI with necessary information to install and operate the JAERI negative ion source. 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 negative ion source to install, check out, and run at the LBL Test Facility. This information shall be non-proprietary and shall not include detailed manufacturing know-how.
- 6.3 DOE shall provide JAERI with all information resulting from the experiments.
- 6.4 Each Party shall provide the other Party with information resulting from the evaluation of the experimental results on the optimization of the negative deuterium ion production.
- 6.5 Each Party shall support the widest possible dissemination of information in Article 6.1, 6.2, 6.3, and 6.4 above for any and all purposes whatsoever, subject to Article 6.6.
- 6.6 Inventions made or conceived in the course of or under the Collaborative Program of this Annex (hereinafter referred to as "arising inventions") shall be identified and reported promptly by DOE to JAERI. 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 the invention. It shall be the responsibility of DOE to appropriately mark reports which disclose inventions that have not been appropriately protected by the filing of a patent application.

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

6.8 The provisions of Article 6.6 and 6.7 shall apply mutatis mutandis to the protection of utility model and of design.

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

7. ASSIGNMENT OF PERSONNEL

JAERI may assign one or more persons to LBL 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. LOAN OF COMPONENT, EQUIPMENT, INSTRUMENT, AND MATERIAL

JAERI is responsible for the shipment of the negative ion source, its repair parts, and necessary instruments. DOE shall accept responsibility for the protection, assembling, installation on the LBL Test Facility, and operation of these components after they have passed LBL inspection upon arrival at LBL. Paragraphs 1, 2, 3, 4, 6 and 7 of Article X of the Implementing Arrangement shall apply to the supply of the components. For the duration of the Collaborative Program, components, equipment, instruments, and material provided by JAERI shall be considered to be the property of the Government of Japan.

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 one (1) year 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.

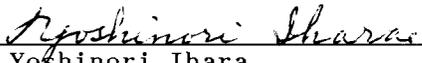
In witness whereof, this Annex has been signed in duplicate in the English and Japanese languages, both being equally authentic.

for THE UNITED STATES
DEPARTMENT OF ENERGY

for THE JAPAN ATOMIC ENERGY
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John F. Clarke
Associate Director for Fusion Energy
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Yoshinori Ihara
President

date February 10, 1989

date January 19, 1989