

MEMORANDUM OF COOPERATION
BETWEEN
THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA, ON THE ONE SIDE
AND
THE MINISTRY OF ECONOMY, TRADE AND INDUSTRY AND THE MINISTRY OF EDUCATION,
CULTURE, SPORTS, SCIENCE AND TECHNOLOGY OF JAPAN, ON THE OTHER SIDE
FOR
COLLABORATION ON DEVELOPMENT OF A VERSATILE TEST REACTOR

The Department of Energy (DOE) of the United States of America , on the one side, and the Ministry of Economy, Trade and Industry (METI) and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan, on the other side, hereinafter referred to individually as a "Participant" or collectively as the "Participants";

RECOGNIZING the Memorandum of Cooperation between the Department of Commerce and the Department of Energy of the United States of America, on the one side, and the Ministry of Economy, Trade and Industry and the Ministry of Education, Culture, Sports, Science and Technology of Japan, on the other side, Concerning Research and Development and Industrial Cooperation in the Nuclear Energy Sector of November 13, 2018;

NOTING their shared desire to continue cooperation in the conduct of research and development (R&D) in technologies related to nuclear energy and the nuclear fuel cycle;

NOTING the importance of efforts by the Participants to expand the development and deployment of advanced fast reactor technology;

NOTING that U.S. R&D efforts include potential deployment of a fast spectrum sodium cooled test reactor, and that Japan's R&D efforts are aimed at an advanced fast reactor technology demonstration;

DESIRING to leverage the expertise of each Participant for the benefit of the Participants; and

ACKNOWLEDGING that DOE is exploring the design, construction and operation of a fast spectrum sodium cooled versatile test reactor,

HAVE REACHED THE FOLLOWING RECOGNITION:

Section 1

Objective

The objective of this Memorandum of Cooperation (MOC) is to establish a framework for the Participants to collaborate on DOE's R&D and potential deployment of a versatile test reactor (VTR) to be used for testing of advanced technologies needed to support future deployment of advanced fast reactors.

Section 2

Areas of Collaboration

DOE is engaged in activities aimed at the research, development and potential deployment of a VTR. In support of this effort, the Participants may collaborate on the following areas under this MOC:

- 2.1 Reactor Design and Safety Analysis – This area includes relevant design and safety studies including experience from other similar facilities such as JOYO and MONJU. Studies associated with systems, sub-systems and components also may be included in this area.
- 2.2 Design of experiments and test vehicles – This area includes the design of standard and advanced test vehicles for testing advanced fuels and materials that can be inserted into a VTR. Previous experience from JOYO may also be included under this area of collaboration.
- 2.3 Instrumentation and Controls for Reactor and Experiments – This area includes instrumentation and sensors development for both the test reactor and experimental vehicles. Big data and data analytics may also be part of this collaboration.
- 2.4 Fuels/Clad and Materials – The fuel choice for VTR is anticipated to be metallic alloy with HT-9 cladding. METI and MEXT are also considering metallic fuel as an option for future reactors. Collaboration may include data and analyses of metallic fuels and cladding materials as well as reactor structural materials.
- 2.5 Modeling and Simulation /Validation – Evaluation of the design and safety analysis tools used within the programs for validation, calibration, and comparison may be included as part of this collaboration. Gap analyses and definition of additional validation experiments may also be part of this effort.

Section 3

Coordination of Activities

- 3.1 The Participants intend to establish an Executive Committee to define and coordinate collaborative activities under this MOC. The Executive Committee should be composed of a representative from each Participant. Decisions of the Executive Committee should be made on the basis of consensus.
- 3.2 The Executive Committee should designate a single-point of contact (POC) for each Participant for each of the collaborative areas identified by the Executive Committee. The POCs should be responsible for defining the collaboration teams, and the structure and schedule of the collaborative activities. As necessary, and subject to the approval of the Executive Committee, the Participants may invite experts from other organizations to participate in collaborative activities under this MOC, including national laboratories or research centers.
- 3.3 The Executive Committee should meet at least once per year, at a time and place to be mutually decided upon to review the progress of the collaboration teams and adjust the areas or scope of the collaborative activities as necessary. The annual meeting is expected to be face-to-face.
- 3.4 The collaboration teams may meet multiple times a year, especially in the early formative phase of the collaboration, and are expected to conduct most of their collaborative activities through virtual meetings and electronic communications.
- 3.5 The Participants may consider temporary staff exchanges for some aspects of the collaborative activities.

Section 4

Implementation

- 4.1 Unless otherwise specified in writing by the Participants, each Participant is responsible for the costs it incurs for its own activities under this MOC.
- 4.2 Each collaborative activity that may involve the sharing of costs or Confidential Information, or that may give rise to the creation of intellectual property or inventions, should be conducted pursuant to a project-specific agreement or other arrangement, as appropriate, which should include detailed provisions for its execution, including such matters as technical scope, management, total costs and payment provisions, schedule, intellectual property and invention rights, and such other matters relevant to the activities to be performed.

Section 5

Information Sharing and Confidentiality

- 5.1 "Confidential Information" as used in this MOC refers to information that: 1) is not generally known or publicly available from other sources; 2) has not previously lawfully been made available to others without obligation concerning its confidentiality; and 3) is not already in the possession of the recipient without obligation concerning its confidentiality.

5.2 The Participants do not intend to create or transfer any intellectual property or inventions, or share Confidential Information under this MOC. If the Participants determine that a particular collaborative activity may lead or has led to the creation of intellectual property or an invention, or requires the sharing of Confidential Information the Participants intend to consult with each other and make appropriate written agreements or other arrangements for the protection and allocation of such intellectual property and inventions, or the sharing of Confidential Information in accordance with Section 4.2 of this MOC.

5.3 Each Participant intends to share with the other Participant all non-proprietary data or results produced by the collaborative activities under this MOC. Upon mutual consent of the Participants and in accordance with applicable laws and regulations, each Participant may disseminate the data or results to third parties (meaning persons or entities not affiliated with the Participants). Nothing in this MOC is intended to restrict either Participant's ability to use or publish the results of its own research activities to the extent it is not generated as part of the collaborative activities under this MOC.

Section 6

General Provisions

6.1 This MOC does not create any legally binding rights or obligations between the Participants.

6.2 Collaborative activities under this MOC are subject to the availability of funds, personnel, and other resources of the Participants.

6.3 Each Participant should conduct the activities contemplated by this MOC in accordance with applicable laws and regulations to which it is subject, and applicable international agreements to which its government is party.

6.4 This MOC in no way restricts either Participant from participating in any activity with other public or private agencies, organizations or individuals.

Section 7

Commencement, Modification and Discontinuation

7.1 Collaborative activities under this MOC may commence upon signature by the Participants and may continue for three years unless discontinued in accordance with paragraph 3 of this Section. Prior to the end of this initial three-year period, the Participants intend to consult with each other regarding a possible continuation of collaborative activities in some or all areas identified in this MOC for a period to be determined by mutual consent.

7.2 This MOC may be modified or extended by mutual written consent of the Participants.

7.3 The Participants may discontinue collaborative activities under this MOC at any time by mutual written consent. Alternatively, a Participant that wishes to discontinue its participation in the activities under this MOC should endeavor to provide at least a 90-day advance written notice to the other Participant.

Signed in triplicate.

FOR THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA:

Signature:



Name:

ED MCGINNIS

Date:

JUNE 12, 2019

Place:

WASHINGTON, DC USA

FOR THE MINISTRY OF ECONOMY, TRADE AND INDUSTRY OF JAPAN:

Signature:



Name:

SHIN HOSAKA

Date:

June 12, 2019

Place:

Tokyo, Japan

FOR THE MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND TECHNOLOGY OF JAPAN:

Signature:



Name:

SAEIKI, Koji

Date:

June 12, 2019

Place:

Tokyo, Japan