

MEMORANDUM OF UNDERSTANDING
AMONG
THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA
AND
THE JAPAN ATOMIC ENERGY AGENCY
AND
THE COMMISSARIAT À L'ÉNERGIE ATOMIQUE ET AUX ÉNERGIES ALTERNATIVES
OF THE FRENCH REPUBLIC
CONCERNING COOPERATION ON SODIUM-COOLED FAST REACTORS

The Department of Energy of the United States of America, the Japan Atomic Energy Agency, and the Commissariat à l'Énergie Atomique et aux Énergies Alternatives of the French Republic, hereinafter the "Participants,"

ACKNOWLEDGING the need to develop an appropriate mix of environmentally safe and secure sources of energy, including nuclear, to meet the needs of their respective countries' populations;

RECOGNIZING the need to address challenges facing all Participants' countries as well as the broader international community of growing energy needs in a manner that contributes to reducing the harmful effects of greenhouse gases on the global climate;

AFFIRMING the overall vision and goals of the International Framework for Nuclear Energy Cooperation (IFNEC), which seeks the safe, secure, and environmentally sustainable development of civilian nuclear energy for peaceful purposes, in a manner that supports nuclear nonproliferation and safeguards;

NOTING the shared commitment of the Participants' countries to preventing nuclear proliferation;

EMPHASIZING the critical role of international safeguards, including the Additional Protocol, in promoting international confidence in the peaceful uses of nuclear energy;

ACKNOWLEDGING that the significant physical and intellectual investment in infrastructure required to support sodium-cooled fast reactor (SFR) development need not be duplicated by each Participant, but rather can be shared and harmonized in an efficient and equitable fashion;

ACKNOWLEDGING that the Participants are committed to research and development (R&D) on relevant topics, with demonstration determined by each Participant on a time scale commensurate with their national requirements; and

DESIRING to continue and expand their collaboration which began under the Memorandum of Understanding among the Department of Energy of the United States of America and the Japan Atomic Energy Agency and the Commissariat à l'Énergie Atomique of the French Republic Concerning Cooperation on Sodium-Cooled Fast Reactor Prototypes of January 31, 2008, as revised (hereinafter referred to as "the 2008 MOU"),

HAVE REACHED THE FOLLOWING UNDERSTANDING:

1. The Participants intend to share information and engage in collaboration on the harmonization of prototype/demonstration (proto/demo) SFR development through, among other considerations, identification of possible complementary areas relating to fast reactor and fuel cycle technologies. This harmonization process should be consistent with the national policy of each Participant's country, with a view to future pursuit of joint infrastructure development and establishment of international concepts for proto/demo reactors. Where practical, the Participants intend to use supporting infrastructure currently in place.
2. The Participants intend to develop a framework, to review reactor design criteria, and hold workshops and planning discussions to reach common recognition of reactor and system requirements.
3. The Participants do not intend to create or transfer any intellectual property under this Memorandum of Understanding (MOU). If the Participants determine that a particular cooperative activity may lead or has led to the creation of intellectual property, the Participants concerned intend to consult with each other and make appropriate written arrangements for the protection and allocation of such intellectual property. Each Participant intends to maintain the confidentiality of any business-confidential information it receives from the other Participants, in accordance with their Non-Disclosure Arrangement Concerning Cooperation on Sodium-Cooled Fast Reactor Prototypes of August 25, 2008.
4. Areas of potential cooperation include:
 - 4.1 General specifications
 1. Establishing design goals and high level requirements for SFRs;
 2. Identifying common safety principles through cooperation with relevant safety authority bodies of each Participant's country;

3. Discussing the power level and type of SFRs; this cooperation may induce convergence and prioritization of several options in different proto/demo SFRs;
4. Exploring the development of a plan to reflect data and experience from Phenix operation and Monju restart to future proto/demo reactors;
5. Discussing a common strategy regarding research and facilities that will be needed to produce and qualify minor actinide-bearing transmutation fuel or targets;
6. Discussing advanced fast reactor fuel cycle characteristics and related technologies with a view to identifying matters for future cooperation;

4.2 Specific Cooperation items: the Participants intend to identify specific cooperation items within each of the following domains:

1. R&D related to the proto/demo SFR development areas:

- safety,
- system configuration,
- advanced materials,
- instrumentation,
- in-service inspection and repair,
- feedback experience of reactor operation (Joyo, Monju, Phenix, SPX, EBR-II, FFTF),
- thermal-hydraulics,
- neutronics

2. Component design and fabrication

A tentative list of candidates and devices or sub-systems for collaborative development is to be developed, listed in priority order for design and/or construction under a cooperative framework agreement.

3. Sharing facilities

The Participants plan to explore options for leveraging the use of existing, new, or refurbished support facilities for component testing, fuel development, or safety

testing. Information on facilities and large experimental programs in the United States, Japan, and France will be further examined in order to select topics of interest.

4. Proto/demo reactor design study

Common and/or shared development issues related to the proto/demo design should be identified. Crucial design requirements are to be discussed in order to identify common and/or development issues that are shared in all stages and are of interest to all Participants.

5. Proto/demo reactors' fuel fabrication

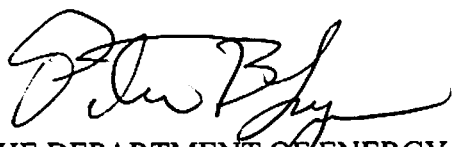
The objective of this item of collaboration is to study the feasibility to fabricate fuels for future proto/demo reactors in the same facility.

5. In planning discussions, the Participants intend to consider the appropriate role of vendors in the United States, Japan and France in collaboration on proto/demo reactor design and component design and fabrication.
6. The Participants share an interest in exchanging strategic views on fuel cycle technologies since the Participants' countries are individually assessing their strategies on fast reactor-related fuel cycle technology development. To this end, the Participants should define themes and schedules for possible collaboration.
7. The Participants intend to continue to coordinate the activities identified in this MOU through the Steering Committee established pursuant to Paragraph 5 of the 2008 MOU.
8. Each Participant should conduct the cooperation under this MOU subject to applicable laws and regulations in its respective country, as well as the provisions of relevant international agreements to which its Government is a party.
9. This MOU does not create any legally binding obligations between or among the Participants. Cooperation under this MOU is subject to the availability of appropriated funds and other resources of the Participants.
10. The activities under this MOU should be coordinated with relevant bilateral cooperation arrangements between any two of the Participants, as well as relevant R&D conducted under the Framework Agreement for International Collaboration on Research and Development of Generation IV Nuclear Energy Systems of February 28, 2005, to ensure consistency and to appropriately leverage complementary activities associated with future generation reactor system R&D.
11. Cooperation under this MOU may commence upon signature. If a Participant wishes to discontinue its participation in the activities contemplated by this MOU, it should endeavor

to provide at least 90 days' advance written notice to the other Participants. The Participants may discontinue their cooperation under this MOU at any time by mutual consent in writing.

12. Subject to paragraph 7 above, this MOU replaces the 2008 MOU.

Signed at Pretoria, in three originals, this 4th day of October 2010.



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



FOR THE JAPAN ATOMIC ENERGY AGENCY:



FOR THE COMMISSARIAT À L'ÉNERGIE ATOMIQUE ET AUX ÉNERGIES
ALTERNATIVES OF THE FRENCH REPUBLIC: