

**ADDENDUM NO. 5 TO THE  
MEMORANDUM OF UNDERSTANDING**

**BETWEEN UNITED STATES DEPARTMENT OF ENERGY AND  
NUCLEAR REGULATORY COMMISSION  
ON NUCLEAR ENERGY INNOVATION**

**Enabling Technologies for Advanced Fuels and Fuel Cycle Applications**

**I. Purpose and Scope**

The purpose of the United States (U.S.) Department of Energy (DOE)/Nuclear Regulatory Commission (NRC) Memorandum of Understanding dated October 7, 2019 (MOU) on Nuclear Energy Innovation is to coordinate DOE and NRC technical readiness and to facilitate the sharing of technical expertise and knowledge on advanced nuclear reactor technologies and nuclear energy innovation, including the activities related to research, development, demonstration, and commercial application by the civilian nuclear industry of safe and innovative nuclear technologies.

To ensure the proper sharing of technical expertise and information between DOE and the NRC, this Fifth Addendum (Addendum) to the Nuclear Energy Innovation Capabilities Act of 2017 (NEICA) MOU addresses the technical coordination of DOE and the NRC regarding research activities related to the safety of advanced fuel technologies, including light-water-reactor fuels designed for enhanced accident tolerance and non-light water reactor fuels, as well as activities related to the fuel cycle, including front-end, in-reactor performance, and back-end (spent fuel) management applications.

These various research activities are coordinated by the NRC's Office of Nuclear Regulatory Research and across several Program Offices at DOE's Office of Nuclear Energy (DOE/NE), including DOE/NE-4 (Nuclear Fuel Cycle and Supply Chain), DOE/NE-5 (Reactor Fleet and Advanced Reactor), DOE/NE-8 (Spent Fuel and Waste Disposition).

The cooperation between DOE and the NRC will balance the need to assure the NRC's independence to avoid compromising its regulatory role with the respective responsibilities of each agency to cost-effectively develop the technical bases for the safe and secure operation and regulation of nuclear energy facilities.

This Addendum does not alter the authorities or independence of the NRC and DOE or their abilities to fulfill their responsibilities.

## **II. Authority**

DOE and the NRC enter into this Addendum to the MOU pursuant to Section V. Organizational Implementation of the MOU dated October 7, 2019.

## **III. Background**

The NRC and DOE both conduct research activities associated with various nuclear power technologies in multiple areas of the nuclear fuel cycle. The NRC conducts research to obtain independent information for use in making timely regulatory judgments, anticipating and resolving safety significant issues, and developing technical bases to support regulatory positions. The DOE conducts research to develop nuclear energy technologies including generation, safety, waste storage and management, and security technologies to help meet energy security, proliferation resistance and climate change goals, including exploring improvements to light water reactor systems and fuel forms to further enhance safety and reliability under severe accident conditions. The DOE also conducts research to develop new and advanced reactor designs and technologies that advance the state of reactor technology, to improve its competitiveness, and help advance nuclear power as a resource capable of meeting the Nation's energy, environmental, and national security needs.

Both the NRC and DOE participate in bilateral and multilateral international cooperative research programs. Although the goals of the NRC and DOE research programs differ in many respects, fundamental data and technical information obtained through joint research activities is recognized as an area of mutual interest and an opportunity to conserve resources and avoid duplication of efforts. Accordingly, it is in the best interest of both parties to cooperate and share data and technical information and, in some cases, the costs related of such research, whenever such cooperation and cost-sharing may be done in a mutually beneficial fashion.

## **IV. Roles and Responsibilities of Each Party**

This Addendum identifies cooperative activities centered around sharing of information and research activities. This will be generally accomplished as follows:

1. Programmatic and Technical Information Exchanges. NRC and DOE will plan and facilitate the exchange of information concerning the objectives, milestones, approaches, and experimental data and results for their ongoing research activities. Information exchange meetings will be held, virtually or in-person, as needed. During these meetings, both parties will provide updates for ongoing research, including activities related to, but not limited to:
  - In-reactor performance of advanced fuel technologies, including increased fuel enrichment and burnup;
  - Materials and manufacturing processes for advanced fuels and fuel cycle applications;
  - Enrichment of uranium hexafluoride and other feed materials;

- Fabrication and transportation of fresh fuels; and
- Management of spent fuel and high-level waste management, including transportation, storage, and disposal.

2. Potential Joint NRC/DOE Sponsored Research and/or Training Activities. NRC and DOE will cooperate, when appropriate, in the identification of additional areas of mutual interest for joint cooperative research, workshops, and/or training activities.

The primary roles and responsibilities of each organization are described below.

### DOE

DOE will provide oversight and direction of its own work, funding authorization, and mission and objectives. DOE will coordinate with NRC on the scope, objectives, research results, and associated funding of mutually agreed cooperative research and/or training activities.

The following are anticipated DOE Roles and Responsibilities:

- DOE will identify points of contact (POCs) to coordinate DOE-NRC information exchanges and cooperative research and/or training activities.
- As appropriate, DOE will provide programmatic and technical information to NRC on research efforts in experimental and analytical activities.
- As appropriate, DOE will provide NRC with access to data, analysis and insights that can support NRC's role as an independent regulator.

### NRC

NRC will provide oversight and direction of its own work, funding authorization, and mission and objectives. NRC will coordinate with DOE on the scope, objectives, research results, and associated funding of mutually agreed cooperative research and/or training activities.

NRC will neither make recommendations regarding specific commercial design or facility concepts nor participate in any DOE selection process.

The following are the anticipated NRC Roles and Responsibilities:

- NRC will identify POC(s) to coordinate DOE-NRC information exchanges and cooperative research and/or training activities.
- As appropriate, NRC will provide programmatic and technical information to DOE that inform DOE's research efforts in experimental and analytical activities.
- As appropriate, NRC will provide DOE with accurate and current information on NRC's regulations, licensing, and certification processes, and/or information needs that would support NRC's safety assessments

## **V. Funding Authorization**

This Addendum is neither a fiscal nor a funds obligation document and does not authorize expenditure or reimbursement of appropriated funds. To the extent activities discussed in this Addendum would require resources beyond the NRC's existing appropriated authorities, the parties may agree to enter into Implementing Interagency Agreements, supplemental to the MOU and this Addendum, that address such activities.

## **VI. Organizational Conflicts of Interest**

DOE and the NRC are aware of the organizational conflict of interest requirements and obligations of the respective agencies under those requirements including Section 170A of the Atomic Energy Act of 1954, as amended. DOE and the NRC will work together to resolve any organizational conflicts that may arise.

NRC Authorizing Official:

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Raymond Furstenau, Director  
Office of Nuclear Regulatory Research  
U.S. Nuclear Regulatory Commission

Date: \_\_\_\_\_

DOE Authorizing Official (NE-4):

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Andrew Griffith  
Deputy Assistant Secretary for  
Nuclear Fuel Cycle and Supply Chain  
Office of Nuclear Energy  
U.S. Department of Energy

Date: \_\_\_\_\_

DOE Authorizing Official (NE-5):

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Alice Caponiti  
Deputy Assistant Secretary for  
Reactor Fleet and Advanced Reactor  
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Office of Nuclear Energy  
U.S. Department of Energy

Date: \_\_\_\_\_

DOE Authorizing Official (NE-8):

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Samuel Brinton  
Deputy Assistant Secretary for  
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Date: \_\_\_\_\_