

ADDENDUM
to
MEMORANDUM OF UNDERSTANDING
BETWEEN
U.S. NUCLEAR REGULATORY COMMISSION
and
ELECTRIC POWER RESEARCH INSTITUTE, INC.
on
COOPERATIVE NUCLEAR SAFETY RESEARCH OF
ACCIDENT TOLERANT FUELS

I. Introduction

The U.S. Nuclear Regulatory Commission (NRC) and the Electric Power Research Institute, Inc. (EPRI) are the Parties to a Memorandum of Understanding on Cooperative Nuclear Safety Research dated September 30, 2016 (the MOU). Pursuant to the MOU, to conserve resources and to avoid needless duplication of effort, the Parties agreed it is in the best interest of both Parties to cooperate and share data and technical information and, in some cases, the costs related to such research whenever such cooperation and cost sharing may be done in a mutually beneficial fashion. This Addendum to the MOU (the Addendum) is entered into by and between the NRC and EPRI effective as of the date of signature of the last of the Parties to execute this Addendum (the Effective Date).

This Addendum is authorized pursuant to Section 31 of the Atomic Energy Act (AEA) and/or Section 205 of the Energy Reorganization Act (ERA). The roles, responsibilities, terms, and conditions of this MOU should not be interpreted in a manner inconsistent with and shall not supersede applicable Federal laws and regulations.

This Addendum describes a cooperative research and development (R&D) program between EPRI and the NRC in the area of accident tolerant fuel (ATF).

II. Objectives

The primary points of contact between the NRC and EPRI will be staff in the NRC's Office of Nuclear Regulatory Research (RES) and EPRI's Nuclear Power Sector (NPS) for research on the safety and performance of new fuel designs being developed with enhanced accident tolerance. The principal areas of interaction will be:

- Research on deterministic ATF thermal-mechanical design criteria.
- Research to characterize the safety and risk significant characteristics of ATF as part of an integrated nuclear reactor system.

III. Scope and Plan

EPRI is coordinating with the nuclear industry on research, technology development, and safety analysis for a number of ATF candidate designs. Some nuclear utilities are considering full-core utilization of ATF to enable certain margin exchange or probabilistic risk assessment (PRA)-driven changes to their licensing basis. EPRI's goal is to facilitate consistent evaluation of ATF candidates and to support the nuclear utilities in making decisions about the use of lead test assemblies, batch loading, and related licensing activities.

The NRC is also conducting work in the area of safety analysis for ATF to ensure adequate protection of public health and safety should ATF be placed in use. Establishing industrywide approaches for consistent evaluation of ATF candidates would greatly support the NRC's effort. The NRC may need to develop a regulatory framework for considering changes to licensing bases. Maintaining up-to-date knowledge of the industry's plans and approach in this area is critical to the NRC's effort.

In this spirit, the NRC and EPRI intend to coordinate in the following manner:

- Research on deterministic ATF thermal-mechanical design criteria.
 - The NRC staff intend to participate in EPRI-sponsored expert elicitations on ATF research and development needs to define figures of merit or performance indicators used to assess thermal-mechanical aspects of ATF performance.
 - The NRC and EPRI staffs intend to discuss data and model gaps in the area of thermal-mechanical performance codes required to accurately model ATF performance.
- Research to characterize the safety and risk significant characteristics of ATF as part of an integrated nuclear reactor system.
 - The NRC staff intend to participate in EPRI-sponsored expert elicitations on key figures of merit or performance indicators for integrated plant performance with various ATF concepts.
 - The NRC staff intend to participate in EPRI-sponsored discussion on key accident sequences for the assessment of integrated plant performance.
 - The NRC and EPRI intend to share information about modeling approaches for ATF designs, possibly including code-comparison exercises.
- The NRC staff intend to participate in bi-annual workshops coordinated by EPRI on research and development progress of ATF concepts.
- The NRC and EPRI staff intend to discuss the NRC's ongoing efforts to build the technical and regulatory infrastructure necessary to review and license ATF designs.

IV. Deliverables and Products

This collaboration is primarily centered around sharing of information, progress reports and perspectives on potential regulatory issues and approaches. There are no formal or written deliverables.

V. Costs and Schedules

This collaboration does not involve any cost-sharing terms for either party. The schedule for the interactions is largely driven by the industry's progress on ATF development and adoption, which is still evolving and, therefore, cannot be defined definitively at this time.

VI. Other Provisions

Nothing in this MOU shall limit the rights or ability of either agency to exercise its authority independently with regard to matters that are the subject of this MOU.

VII. Project Direction and Coordination

A kick-off meeting will be organized once this MOU addendum is implemented. The NRC and EPRI staff expect to meet periodically to discuss progress and any emergent issues. All technical interactions will be managed through a single point-of-contact for each part. Technical meetings to coordinate this effort will be arranged through the project contacts. The project contacts are:

NRC:
Michelle Bales

EPRI:
Aladar Csontos

AGREEMENT

 /RA/
Michael F. Weber
Director of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission

 /RA/
Neil Wilmshurst,
Vice President and Chief Nuclear Officer
Electric Power Research Institute, Inc.

Date: **October 23, 2017**

Date: **October 9, 2017**

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DISTRIBUTION:

OGC (for NLO)
 J. Schmidt, NRO
 J. Monninger, NRO
 P. Clifford, NRR
 J. Whitman, NRR
 M. Gavrilas, NRR
 M. Bales, RES
 I. Porter, RES
 R. Lee, RES
 M. Case, RES
 M. Weber, RES
 B. Smith, NMSS
 J. Hammelman, NMSS
 B. Ficks, OCFO
 R. Allwein, OCFO
 B. Baker, OIG
 M. Grodin, OIG

ADAMS Accession No.: ML17248A392

OFFICE	Tech Edit	RES/DSA	RES/DSA	NMSS/FSCE	NRO/DSRA
NAME	J. Zabel	M. Bales	I. Porter	J. Hammelman	J. Schmidt
DATE	8/15/17	7/28/17	8/01/17	8/01/17	8/01/17
OFFICE	NRR/DSS	NRR/DSS	RES/DSA	RES/DSS	D:NRO/DSRA
NAME	J. Whitman	P. Clifford	R. Lee	R. Lukes	J. Monninger
DATE	8/11/17	8/04/17	8/15/17	8/03/17	9/12/17
OFFICE	D:NRR/DSS	D:RES/DSA	DD:NMSS/FSCE	OGC (NLO)	D:RES
NAME	M. Gavrilas	M. Case	B. Smith	V. Hoang	M. Weber
DATE	8/22/17	8/31/17	9/08/17	9/21/17	10/23/17

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