



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

July 12, 2018

MEMORANDUM TO: John P. Segala, Chief  
Advanced Reactor and Policy Branch  
Division of Safety Systems, Risk Assessment and Advanced  
Reactors  
Office of New Reactors

FROM: Lucieann Vechioli, Project Manager **/RA/**  
Advanced Reactor and Policy Branch  
Division of Safety Systems, Risk Assessment and Advanced  
Reactors  
Office of New Reactors

SUBJECT: SUMMARY OF JUNE 14, 2018, PUBLIC MEETING TO DISCUSS  
REGULATORY IMPROVEMENTS FOR ADVANCED REACTORS

On June 14, 2018, the U.S. Nuclear Regulatory Commission (NRC) held a Category 2 public meeting with stakeholders, Department of Energy (DOE), national laboratories, and Nuclear Energy Institute (NEI), to discuss ongoing initiatives within the industry and NRC related to the development and licensing of non-light water reactors (non-LWRs) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18159A159). Enclosure 1 contains a list of meeting attendees and participants who joined via webinar. Enclosure 2 has the meeting agenda. The slides and meeting handouts are available in ADAMS Accession No. ML18169A379.

NRC staff described efforts to ensure environmental reviews associated with National Environmental Policy Act appropriately reflect possible attributes of advanced reactor designs such as smaller site areas and lesser water use. The staff has formed a working group to identify potential improvements for advanced reactor designs. The working group is identifying lessons learned from recent power reactor reviews and from licensing of facilities for Molybdenum-99 production. Stakeholders reinforced the need to ensure that the scope and depth of environmental reviews were appropriate for the expected effects on the environment of construction and operation of advanced reactors. Specific issues such as reassessing the NRC's review of need for power and possible use of generic environmental impact statements were discussed. This topic will be addressed in future periodic stakeholder meetings.

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NRC staff provided an update on the emergency preparedness rulemaking for small modular reactors and other new technologies (ONT). Reference to ONT within the rulemaking refers to non-LWRs and medical isotope facilities. The staff summarized that the rulemaking was technology inclusive, risk informed and performance based, and included the principle of a consequence oriented approach (dose at distance) to determine emergency planning zones. The next steps in the rulemaking process include meetings with the Advisory Committee on Reactor Safeguards and submission of the proposed rulemaking package to the Commission in October 2018.

Craig Welling of the DOE's Office of Nuclear Energy (NE) provided a summary of advanced reactor activities, included the announcement of recent funding of projects to research and develop non-LWR technologies.

The afternoon discussions focused largely on fuel qualification activities related to metallic fast reactor fuels, TRISO fuels, and molten salt reactors. Fuel cycle and licensing modernization project (LMP) topics were also discussed later in the meeting.

- The discussion of metallic fast reactor fuels was provided by Tom Sowinski of DOE/NE with assistance from Abdellatif Yacout from Argonne National Laboratory (ANL). The presentation summarized the history of sodium fast reactor (SFR) fuels research and the Metal Fuel Irradiation and Physics Analysis Databases (FIPD). A key point of the presentation involved DOE's SFR metallic fuel data qualification plan (See ANL technical reports "Pre-Licensing Evaluation of Legacy SFR Metallic Fuel Data" and "Quality Assurance (QA) Program Plan for SFR Metallic Fuel Data Qualification.") Current plans are for the implementation of the legacy data QA program plan in fiscal year 2019 and NRC involvement to assess and potentially approve the QA program plan and its implementation was encouraged. The NRC staff will follow up on this program with DOE.
- Mark Holbrook and Paul Demkowicz from Idaho National Laboratory (INL) provided a presentation and supported discussions related to a TRISO limited scope topical report. The presentation summarized the Advanced Gas Reactor (AGR) Fuel Development and Qualification Program at INL, including describing the AGR series of tests on TRISO particles. The topical report is being developed by the Electric Power Research Institute (EPRI) and is expected to be submitted to the NRC in early 2019 for review.
- George Flanagan from Oak Ridge National Laboratory (ORNL) presented on fuel qualification for molten salt reactors, and the role the liquid fuel plays in the overall safety of such designs. Dr. Flanagan broadened the discussion beyond issues of in-reactor fuel performance and identified special consideration of liquid fuel in terms of reactor safety, security and safeguards, waste management, and transportation.

James Hammelman from the Office of Nuclear Material Safety and Safeguards provided an update of the current activities in the agency's efforts to plan for and conduct regulatory reviews of advanced reactors with emphasis on the advanced reactor fuel cycles and transportation activities. Staff keep track and participate in industry's advanced reactors activities. They also take advantage of learning opportunities such as the molten salt reactors training. As the advanced reactor designs mature and move through the certification process, NMSS will continue to work to identify specific technical issues associated with the fuel that will have to be addressed for specific applications, and will develop guidance as necessary to address any unique issues.

The meeting ended with a discussion of other topics and future meetings. The date of the next meeting is tentatively scheduled for July 26, 2018. The staff suggested a discussion of performance and testing of heat removal systems (e.g., natural circulation reactor cavity cooling system) at the next meeting and requested stakeholders identify other potential agenda topics for the next meeting.

Enclosures:

1. Meeting attendance
2. Agenda

SUMMARY OF June 14, 2018, PUBLIC MEETING TO DISCUSS TO DISCUSS REGULATORY IMPROVEMENTS FOR ADVANCED REACTORS – DATED July 12, 2018

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**ADAMS Accession No.: ML18193B041**

**\*via e-mail**

**NRO-002**

<b>OFFICE</b>	NRO/DSRA	NRO/DSRA*
<b>NAME</b>	LVechioli	JSegala (WReckley for)
<b>DATE</b>	07/12/18	07/10/18

**OFFICIAL RECORD COPY**

## MEETING ATTENDANCE

### Advanced Reactors Stakeholder Meeting

Two White Flint Room 2B03  
Thursday, June 14, 2018

Name		Organization
Daniel	Doyle	NRC/NMSS
Jim	Hammelman	NRC/NMSS
Wendy	Reed	NRC/NMSS
Arlon	Costa	NRC/NRO
Kevin	Coyne	NRC/NRO
Jack	Cushing	NRC/NRO
Tim	Drzewiecki	NRC/NRO
Jan	Mazza	NRC/NRO
John	Monninger	NRC/NRO
Hanh	Phan	NRC/NRO
Marie	Pohida	NRC/NRO
Bill	Reckley	NRC/NRO
Jeff	Schmidt	NRC/NRO
John	Segala	NRC/NRO
George	Tartal	NRC/NRO
Boyce	Travis	NRC/NRO
Lucieann	Vechioli	NRC/NRO
Joe	Williams	NRC/NRO
Paul	Clifford	NRC/NRR
Steven	Lynch	NRC/NRR
Michelle	Moser	NRC/NRR
Trish	Milligan	NRC/NSIR
Ed	Roach	NRC/NSIR
Steve	Bajorek	NRC/RES
Nathanael	Hudson	NRC/RES
Lucas	Kyriazidis	NRC/RES
Ian	Porter	NRC/RES

Abdellatif	Yacout	ANL
Steven	Kline	Bechtel
Jana	Bergman	Curtiss Wright
Tom	Sowinski	DOE/NE
Craig	Welling	DOE/NE
Christian	Marciulescu	EPRI
Farshid	Shahrokhi	Framatome
Peter	Hastings	Kairos Power
Kati	Austgen	NEI
Russ	Bell	NEI
Everett	Redmond	NEI
Caroline	Cochran	Oklo
George	Flanagan	ORNL
Donald	Kovacic	ORNL
Jeff	Merrifield	Pillsbury
Bo	Saulsbury	PNNL
Pete	Gaillard	TerraPower
Jim	Gresham	Westinghouse

<b>Attendance List – Webinar Attendees</b>		
<b>Name</b>		<b>Organization</b>
Dennis	Andrukat	NRC
Randy	Belles	ORNL
John	Bolin	GA
Scott	Bussey	NRC
Andy	Casella	PNNL
Timothy	Crook	Transatomic Power
Paul	Demkowicz	INL
Janelle	Eddins	DOE
Madeline	Feltus	DOE
Paolo	Ferroni	Westinghouse
Ashley	Finan	NIA
Michelle	Gonzalez	NRC
Hans	Gougar	INL

Nathan	Hall	SWRI
Kathy	Halvey Gibson	NRC
Mark	Holbrook	INL
Lane	Howard	SWRI
N. Prasad	Kadambi	self
Diana	Li	DOE
Jun	Liao	Westinghouse
Sara	Lyons	NRC
Michael	Mayfield	self
Bruce	McDowell	PNNL
Wayne	Moe	INL
Chantal	Morin	CNSC
Tara	Neider	Terrapower
Spencer	nelson	Clearpath
Ronald	Omberg	PNNL
JongSeuk	PARK	KINS
Alex	Pavlak	self
Mike	Poore	ORNL
Alex	Popova	Oklo
Robin	Rickman	Terrestrial USA
Sandra	Sloan	BWXT
Tanju	Sofu	ANL
Andrew	Sowder	EPRI
James	Vollmer	Terrapower
Tammy	Way	AdSTM
Doug	Weaver	Westinghouse
Staci	Wheeler	ARTC
Derek	Widmayer	NRC
Andy	Zach	US House

## AGENDA

### Advanced Reactors Stakeholder Meeting

Two White Flint Room 2B03

Thursday, June 14, 2018

<b>TIME</b>	<b>TOPIC</b>	<b>LEAD</b>
9:00 – 9:15am	Introduction	NRC
9:15 – 10:30am	Environmental reviews	ALL
10:30 – 10:45am	Break	ALL
10:45 – 12:00pm	Emergency planning rulemaking	ALL
12:00 – 1:00pm	Lunch	ALL
1:00 – 2:00pm	Fuel qualification - metal fuel – data base and legacy data	DOE/ANL
2:00 – 2:30pm	Fuel qualification – TRISO fuel	EPRI
2:30 – 2:45pm	Break	ALL
2:45 – 3:15pm	Fuel qualification – molten salt reactors	ORNL
3:15 – 3:45pm	Fuel cycle and transportation	NRC
3:45 – 4:00pm	Licensing modernization project guidance	NRC/LMP
4:00 – 4:15pm	Policy table discussion	ALL
4:15 – 4:30pm	Future topics and public comments	ALL