



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

March 14, 2019

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: William Reckley, Senior Project Manager */RA/*  
Advanced Reactor and Policy Branch  
Division of Safety Systems, Risk Assessment and Advanced  
Reactors  
Office of New Reactors

SUBJECT: SUMMARY OF FEBRUARY 7, 2019, PUBLIC MEETING TO  
DISCUSS REGULATORY IMPROVEMENTS FOR ADVANCED  
REACTORS

On February 7, 2019, the U.S. Nuclear Regulatory Commission (NRC) held a Category 2 public meeting with stakeholders, including the 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. ML19023A538). The majority of the meeting was focused on discussions of civil/structural issues, including the possible use of seismic isolators as part of the design and licensing of advanced reactors. Enclosure 1 contains a list of meeting attendees and participants who joined via webinar. The slides and meeting handouts are available in ADAMS Accession No. ML19045A620.

NRC staff from the Office of New Reactors (NRO) provided a presentation on NRC activities related to improving the efficiency of environmental reviews for future nuclear power plants. Future discussions will include the staff's plans to prepare interim staff guidance to address advanced reactor designs and industry suggestions to explore additional improvements, such as preparing generic environmental impact statements.

Mr. Jason Redd of Southern Company introduced the focus area of the meeting, which was civil/structural issues and related regulatory interfaces for the advanced reactor community. Mr. Redd identified a number of items and included an "ask" of either the NRC or industry to ensure the interactions would maintain a positive momentum following the meeting. The items, asks, and planned activities are summarized below:

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Table 1: Follow-up Activities From February 7, 2019 Stakeholder Meeting Civil/Structural		
Item	Ask	Activities Going Forward
General	Technical and regulatory issues related to the civil/structural design features for advanced reactors requires coordination between the NRC, industry, standards development organizations (SDOs), and individual developers. NRC and industry should have points of contact and overall plans or roadmaps to help ensure activities are being coordinated.	The February 7 <sup>th</sup> stakeholder meeting provided a starting point and future stakeholder meetings can be used to help coordination – but it is more likely that meetings dedicated to civil/structural issues will be needed. For NRC, the coordination will remain within the advanced reactor program with an assigned project manager (to be named in the near future) to organize participation from appropriate technical staff in various offices. A mapping of issues to points of contacts within industry organizations and SDOs will be developed.
Licensing Modernization	NRC continue towards approval and issuance of DG-1353 to address determination of licensing basis events, safety classification, and defense in depth	Staff continues efforts to issue draft DG-1353 for public comment and prepare a related Commission paper to affirm approach and resolve policy issues. Updates to be provided via NRC web page and future meetings. The staff will work to coordinate NRC and industry activities related to technology-inclusive, risk-informed, and performance-based guidance for seismic safety with other advanced reactor guidance.
Design Details in Licensing Documents	NRC clarify the level of detail expected in applications and ensure mutual understanding of terms such as “typical” and “representative”	Staff plans to interface with advanced reactor community to develop and/or endorse guidance addressing level of detail in applications. This activity expected to begin in mid-2019 and result in a follow-on regulatory guide to DG-1353. Updates to be provided via NRC web page and future meetings.
Changes During Construction	NRC establish predictable change processes to align requirements for prior approval of changes with the potential impact on public health and safety	Staff interacting with licensees with plants under construction and plans to address issue within planned Part 50/52 rulemaking. Item also likely to be addressed within development of a technology-inclusive framework as required by the Nuclear Energy Innovation and Modernization Act. Updates to be provided via NRC web page and future meetings.
NRC Staff Training on Novel Features and Innovative Approaches	Industry work with NRC staff to ensure opportunities for training, exposure, and experience with proposed novel features and innovative features.	Staff agreeable to identifying specific training needs and opportunities through interactions with labs; universities; societies and trade organizations; and specific developers, licensees, or applicants.

Seismic Isolation	Near-term engagements on development of seismic isolation analysis methodology and acceptance criteria	Staff to make NUREG/CR reports available to public (see later in this summary), continue engagements through SDOs (ASCE for example), and work with DOE and the external advanced reactor community on endorsement/preparation of guidance (regulatory guide for example) to support possible use of seismic isolators....
Modular Construction and Factory Fabrication	NRC policy re-affirmation on level of detail necessary to make finding of reasonable assurance of adequate protection; agreement on role of tolerances and treatment in licensing documents, and lessons learned from SERs involving modular construction	Staff plans to continue ongoing discussions with LWRs and interface with advanced reactor community to develop and/or endorse guidance addressing level of detail in applications. This activity expected to begin in mid-2019 and result in a follow-on regulatory guide to DG-1353. Updates to be provided via NRC web page and future meetings.
Concrete and Steel (high temperatures)	What are NRC staff's current and planned activities in the area of concrete and structural steel exposed to high-temperature environments	Staff has sponsored some research in the area of environmental (temperature, irradiation) effects on concrete and steel. Importance for specific technologies or designs would determine needed justifications—and possibly additional research and development—on the part of industry, DOE, or others.
Concrete Reinforcement with Headed Reinforcement	What are NRC plans for endorsement of ACI 318-11, Section 12.6	Staff continues participation in SDOs and will consider addressing within existing regulatory guidance framework for concrete structures if requested to endorse.
Steel Plate and Concrete Composite (SC) Construction	What are NRC plans for endorsement of AISC N690-18	Staff plans to complete its ongoing review of the N690 standard and proceed to the drafting of a regulatory guide (DG-1304) with the staff position on N690-18.
Advanced Concrete Materials (including high strength and fiber reinforced concretes)	What are NRC plans for endorsement of developments in advanced concrete materials	Staff continues participation in SDOs and will consider addressing within regulatory guidance framework for concrete structures if requested to endorse.

NRC staff members Jose Pires (RES) and Jimmy Xu (NRO) provided a summary of NRC activities related to seismic isolation, steel plate composite construction, and risk-informed performance-based approaches to seismic safety. The presentation mentioned several reports that the NRC staff expected to be published in the near future. The first report, NUREG/CR-7253, "Technical Considerations for Seismic Isolation of Nuclear Facilities," was made available on the NRC's webpage following the meeting (ADAMS Accession No. ML19050A422). The other reports mentioned (NUREG/CR-7254 on Sliding Bearings and NUREG/CR-7255 on Elastomeric Bearings) are expected to be made available on the NRC website within several weeks of this meeting summary.

Mr. Marc Nichol of Nuclear Energy Institute (NEI) provided a presentation on new plant cost reduction and regulatory interactions. Challenges to the development and licensing of advanced reactors include the probable use of advanced manufacturing techniques. Coincidentally, there was an NRC public meeting on advanced manufacturing held on the morning of February 7, which is summarized in a memorandum dated February 13, 2019 (ADAMS Accession No. ML19038A468).

Dr. Chandu Bolisetti of Idaho National Laboratory described activities to support design optimization for safety and cost using MASTODON computer simulation tools for evaluating seismic risks.

Dr. A Whittaker of the University at Buffalo summarized cost breakdowns for new build nuclear plants, highlighting the high contributions related to civil/structural design and construction. Dr. Whittaker provided background on the use of seismic isolation in nuclear designs and other applications as well as summarizing current activities related to American Society of Civil Engineers standards and design and analysis projects supported by advanced reactor developers, Electric Power Research Institute, and Department of Energy.

Marty Stutzke of the NRC staff supported a discussion on the possible development of generic seismic hazard curves to support the design process. The discussion of addressing external hazards (with focus on seismic hazard) during the design process was followed by a general discussion of civil/structural issues and insights from recent licensing and construction activities offered by Sujit Samaddar of the NRC staff.

The meeting ended with a discussion of other topics and future meetings. The date of the next meeting is scheduled for March 28, 2018. Agenda topics for the next meeting include NRC response to the Nuclear Energy Innovations and Modernization Act, the development of guidance of mechanistic source terms, and the possible revision of guidance related to population densities and the siting of nuclear power plants.

Enclosure:

1. List of attendees

SUMMARY OF FEBRUARY 7, 2019, PUBLIC MEETING TO DISCUSS TO DISCUSS  
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**NRO-002**

<b>OFFICE</b>	NRO/DSRA	NRO/DRSA
<b>NAME</b>	WReckley	JSegala
<b>DATE</b>	03/12/2019	03/14/2019

**OFFICIAL RECORD COPY**



<b>Attendance List – Attended at least part of meeting in person</b>		
<b>Name</b>		<b>Organization</b>
Jim	Hammelman	NRC/NMSS
Olivier	Lareynie	NRC/NMSS
Manas	Chakravorty	NRC/NRO
Amy	Cubbage	NRC/NRO
Jack	Cushiing	NRC/NRO
Michelle	Hart	NRC/NRO
Ata	Istar	NRC/NRO
Maryann	Khan	NRC/NRO
Stu	Magruder	NRC/NRO
John	Monninger	NRC/NRO
Cliff	Munson	NRC/NRO
Alissa	Neuhausen	NRC/NRO
Donald	Palmrose	NRC/NRO
Sunwoo	Park	NRC/NRO
Pravin	Patel	NRC/NRO
Hanh	Phan	NRC/NRO
Bill	Reckley	NRC/NRO
Robert	Roche-Rivera	NRC/NRO
Sujit	Samaddar	NRC/NRO
John	Segala	NRC/NRO
Martin	Stutzke	NRC/NRO
George	Tartal	NRC/NRO
Vaughn	Thomas	NRC/NRO
Boyce	Travis	NRC/NRO
Jim	Xu	NRC/NRO
Ismael	Garcia	NRC/NRR
George	Thomas	NRC/NRR
Brian	Wittick	NRC/NRR
Michelle	Sampsn	NRC/NSIR
Bill	Orders	NRC/OCMAC
Jinsuo	Nie	NRC/RES
Jose	Pires	NRC/RES
Frederick	Sock	NRC/RES

Spencer	Nelson	Clearpath
Nilesh	Chokshi	Consultant
Prasad	Kadambi	Consultant
Jana	Bergman	Curtiss-Wright
Tom	Miller	DOE/NE
Farshid	Shahrokhi	Framatome
Alan	Beard	GE-H
Chandu	Bolisetti	INL
Darrell	Gardner	Kairos
Stephen	Burdick	Morgan Lewis
Kati	Austgen	NEI
Marc	Nichol	NEI
Bo	Saulsbury	PNNL
Amir	Afzali	Southern Co
Jason	Redd	Southern Co
Andrew	Whittaker	University at Buffalo
Jill	Monahan	Westinghouse



<b>Attendance List – Webinar Attendees</b>		
<b>Name</b>		<b>Organization</b>
George	Abatt	Becht
Randy	Belles	ORNL
David	Blee	USNIC
John	Brellenthin	TVA
Matthew	Brenner	Bechtel
Tim	Cahill	Bechtel
Kevin	Casey	TVA
Michelle	Catts	GE-H
Gordon	Cleifton	INL
William	Corwin	AdRxMatls
Arlon	Costa	NRC/NRO
Dayna	Dority	NRC/NRO
Neil	Haggerty	EXCEL
Michelle	Hayes	NRC/NRO
William	Horak	BNL
Alex	Huning	ORNL
Bhagwat	Jain	NRC/NRO
Tanya	Kirby	GE-H
Juan	Lopez	NRC/NRR
Sanj	Malushte	Bechtel
Jan	Mazza	NRC/NRO
William	McGlenn	ICF
Nicholas	McMurray	NRC/NRO
Brian	Meadors	GE-H
Farhang	Ostadan	Bechtel
Anil	Patnaik	Univ of Akron
Alex	Popova	Oklo
Pranab	Samanta	BNL
Dogan	Seber	NRC/RES
Sam	Sham	ANL
Charles	Sills	Eurasiacenter
Patrick	Snouffer	Bechtel
Luben	Todorovski	GE-H

John	Tomon	NRC/RES
Nanette	Valliere	NRC/OCMSB
Andrew	Zach	US Senate