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

December 10, 2019

MEMORANDUM TO: Benjamin G. Beasley, Chief
Advanced Reactor Licensing Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

FROM: Mallecia A. Sutton, Senior Project Manager ***/RA/***
Advanced Reactor Licensing Branch
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Production and Utilization Facilities
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF NOVEMBER 15 AND 20, 2019, PUBLIC MEETINGS TO DISCUSS EXPLORATORY PROCESS FOR DEVELOPING AN ADVANCED NUCLEAR REACTOR GENERIC ENVIRONMENTAL IMPACT STATEMENT

On November 15 and November 20, 2019, the U.S. Nuclear Regulatory Commission (NRC) held Category 2 public meetings with stakeholders and the public, to discuss the NRC's exploratory process for determining whether to proceed with developing an advanced nuclear reactor (ANR) generic environmental impact statement (GEIS). The meeting notice is available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. ML19304B011 and the presentations slides are available at Accession No. ML19322A198. The enclosure lists the meeting attendees and participants who joined via webinar.

The meetings began with a presentation by Mallecia Sutton and Jack Cushing. The NRC staff informed the stakeholders and the public that the NRC was gathering information on the potential environmental effects of ANR designs to determine whether to proceed with developing a GEIS. The purpose of the GEIS is to define and assess the scope and impact of the environmental effects of construction and operation of ANRs. The GEIS would identify and assess impacts that are expected to be generic and the impacts that need to be addressed in site-specific supplemental environmental impact statements (EISs).

The NRC staff asked a series of questions, including:

> Should the scope of the ANR GEIS include reactors regardless of technology or be limited to specific reactor technologies?
>
> What reactor sizes (footprint) and power levels should the NRC include in the scope of the ANR GEIS?
>
> Should the NRC consider a set of bounding plant parameters when developing the scope of the ANR GEIS? If so, what parameters should be considered?

The NRC staff mentioned that it did have experience evaluating the environmental impacts using a plant parameter envelop (PPE) to bound a number of reactor types. For example, the NRC has issued EISs for early site permits based on a PPE that bounded a number of reactors. For instance, the North Anna early site permit (ESP) PPE bounded large light-water reactors (LWRs) such as the ESBWR and the AP1000, the GT-MHR and the Pebble Bed Modular Reactor (a modular helium cooled, graphite moderated reactor). The EIS used the PPE approach to resolve the issues for the LWRs and the gas cooled reactors except for the fuel cycle impacts for the gas cooled reactors.

During the November 15, 2019, meeting, Jason Wright (Southern Company) asked if the NRC would like issues identified that may have been important for large LWRs but are not important for advanced reactors. The NRC staff responded that was the type of information needed.

During the November 20, 2019 meeting, Joe Giacinto (NRC) asked if the staff will consider Canada's environmental experience in reviewing advance reactors. Jack Cushing (NRC) replied that it was good suggestion and that the staff would consider Canada's experience as well as input from other stakeholders.

To facilitate the dialogue, the NRC staff asked and answered the following questions.

1. Why is the NRC conducting this exploratory process?

   As explained in the presentation, the NRC is seeking to gather information needed to determine whether to develop a GEIS for the construction and operation of ANRs. That is also part of the NRC's efforts to align with the Nuclear Energy Innovation and Modernization Act ANR requirements.

2. How can the public help in this exploratory process?

   Proponents and developers of ANRs can describe how the reactor will interact with the environment. Such as: how big is the nuclear plant? What materials will be needed to construct and operate the nuclear plant? What would the nuclear plant emit and/or release into the environment? Where would be the best location for the nuclear plants? What additional infrastructure would be required?

3. How can the NRC evaluate the impacts from constructing and operating any type and size of ANRs to be located anywhere in the United States?

   This is part of what is to be determined in this exploratory process. One approach is to create plant parameter envelopes (PPE) for different size and types of reactors, possibly one for micro-reactors and other small reactors. This is similar to the PPE used in ESP applications.

4. How can you describe the environment? Are you going to use a bounding envelope case for the affected environment?

Not exactly, but perhaps a similar concept. For each resource area, the subject matter expert(s) preparing the GEIS would make assumptions about the affected environment and then analyze the impact of a surrogate reactor that fits within the bounds of the PPE on that environment. The NRC staff may have to address more than one surrogate reactor type and more than one affected environment scenario.

5. What happens if an application does not fit within the bounds of PPE or the assumptions made in the GEIS?

   The applicant would need to demonstrate that they fit within the bounds of PPE and the assumptions about the affected environment. If the project does not fit within the bounds of both the PPE or the assumptions about the affected environment, then the application would have to provide supplementary information that would allow the staff to evaluate impacts that fall outside of the generic analysis.

6. What if a designer does not know the affected environment that their project could impact?

   The NRC staff understands that a designer would like to be capable of siting a reactor in as many different settings as possible. However, we must make some assumptions about the affected environment. For example, if a plant were to use large amounts of cooling water (like a large LWR), then the designer could assume that the plant would be located where water availability is not an issue, such as at a coastal location.

   The siting studies completed in the past for new reactors used a number of siting factors. Some factors were safety related such as seismic, flooding, etc, while others were environmental such as water availability and avoidance of wetlands or endangered species. The importance of individual factors depends on site-specific conditions regarding how much of the resource would be used compared to how much is available.

7. Why should a designer or other party contemplating an application for an advanced reactor take the time to provide the NRC with information?

   The more complete the information the NRC receives, the more informed the decision will be to determine if there is a benefit to proceeding with a GEIS. If the NRC then does proceed with a GEIS, it would be more likely to develop a GEIS resolving more issues generically and leaving fewer issues to be addressed in a supplemental EIS.

8. Is the approach you described the one you plan to follow if you do decide to develop a GEIS?

   Not necessarily. We are looking for feedback and ideas from the advanced reactor stakeholders on this approach and if they can suggest another approach we should consider.

Enclosure:
As stated

SUBJECT: SUMMARY OF NOVEMBER 15 AND 20, 2019, PUBLIC MEETING TO DISCUSS EXPLORATORY PROCESS FOR DEVELOPING AN ADVANCED NUCLEAR REACTOR GENERIC ENVIRONMENTAL IMPACT STATEMENT DATED:

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OFFICE	NRR/DANU/BC	NRR/DORL/LLPB/LA	NMSS/REFS/PM
NAME	BBeasley	DHarrison*	JCushing*
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OFFICE	NRR/DANU/PM	NMSS/REFS/ERRB/BC	
NAME	MSutton*	KErwin*	
DATE	11/21/19	11/21/19	

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Attendance List for November 15, 2019
Meeting on Exploratory Process for
Developing an Advance Nuclear Reactor
Generic Environmental Impact Statement

NAME	**Affiliation**
Jack Cushing	US Nuclear Regulatory Commission (NRC)
Mallecia Sutton	NRC
Kevin Folk	NRC
Ken Erwin	NRC
Donald Palmrose	NRC
Laura Schwartz	International Technology and Trade Associates (ITTA)
Mr. Masaharu Mogaki	Japan Nuclear Regulation Authority (JNRA)
Mr. Shuntaro Matsuki	JNRA
Mr. Takuro Oguchi	JNRA
Ms. Mayu Konishi	JNRA
Ms. Hikari Hadano	JNRA
Ms. Chiho Horiuchi	JNRA
Ms. Chisa Kaji	JNRA
Mr. Eric Lundell	ITTA
Jeff Rikhoff	NRC
Nathan Hall	Center for the Nuclear Waste Regulatory Analyses
Kati Austgen	Nuclear Energy Institute (NEI)
Robert Krsek	NRC
Jason Wright	Southern Company

Attendance List for November 20, 2019
Meeting on Exploratory Process for
Developing an Advance Nuclear Reactor
Generic Environmental Impact Statement

NAME	**Affiliation**
Jack Cushing	NRC
Mallecia Sutton	NRC
Donald Palmrose	NRC
Mike Mazaika	NRC
Dale Fulton	Southern Nuclear
Steve Maheras	Pacific Northwest National Laboratory (PNNL)
Bo Saulsbury	PNNL
Jeffrey Rikhoff	NRC
Nathan Hall	CNWRA
Andrew Kugler	Nepatech
Ben Beasley	NRC
Pet Gaillard	Terrapower
Richard Paese	Westinghouse Electric Company
Dave Goodman	PNNL
Nicholas Murray	ClearPath
Andrew Zach	Senate Environment and Public Works Committee
Steve Chanin	Citizen
Bruce McDowell	PNNL
Eva Hickey	PNNL
Laura Willingham	NRC
Kati Austgen	NEI
Joe Giacinto	NRC
Steve Kline	Bechtel
John Price	Kairos

Enclosure