UNITED STATES
NUCLEAR REGULATORY COMMISSION
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March 4, 2020

MEMORANDUM TO: John R. Tappert, Director
Division of Rulemaking, Environmental, and Financial Support
Office of Nuclear Material Safety
and Safeguards

FROM: Kenneth T. Erwin, Chief ***/RA Peyton Doub Acting for/***
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SUBJECT: RESPONSES TO PUBLIC COMMENTS RECEIVED ON THE EXPLORATORY PROCESS FOR ADVANCED NUCLEAR REACTOR GENERIC ENVIRONMENTAL IMPACT STATEMENT

Enclosed is the response to comments received on the exploratory process for the advanced nuclear reactor generic environmental impact statement (GEIS). The Staff received comments that were supportive of the development of a GEIS as well as ones that opposed the development of a GEIS. Commenters that supported the GEIS thought that it would improve the efficiency of the environmental review process. Commenters that did not support development of a GEIS thought that the GEIS would be premature at this time and that there was not sufficient information available to the Staff to resolve issues generically. The comments we received were used to inform the Staff's decision that developing a GEIS is viable for advanced reactors. The Staff plans to use a technology-neutral plant parameter envelope approach to bound any advanced reactor project up to approximately 30 MWth per reactor.

Enclosure:
Responses to Public Comments Received
on Exploratory Process for Advanced
Nuclear Reactor GEIS

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SUBJECT: RESPONSES TO PUBLIC COMMENTS RECEIVED ON THE EXPLORATORY PROCESS FOR ADVANCED NUCLEAR REACTOR GENERIC ENVIRONMENTAL IMPACT STATEMENT

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Responses to Public Comments Received on the Exploratory Process for an Advanced Nuclear Reactor Generic Environmental Impact Statement

U.S. Nuclear Regulatory Commission

Office of Nuclear Material Safety and Safeguards

Division of Rulemaking, Environmental, and Financial Support

February 2020

Enclosure

Responses to Public Comments Received on Exploratory Process for Advanced Nuclear Reactor GEIS

E-mail Comment from Barry Zalcman, January 24, 2020 (Adams Accession No. ML2004D985)

Comment: The commenter raises multiple arguments for why the situation is not presently ripe for development of an advanced reactor GEIS as proposed in the ClearPath white paper dated February 19, 2019, while encouraging the NRC staff to begin updating its environmental review infrastructure to be better prepared for eventual receipt of advanced nuclear reactor licensing applications. The commenter states that the current environmental review processes developed over more than five decades by NRC and its predecessor agency, the Atomic Energy Commission, for licensing new nuclear reactors are already efficient and do not have to be streamlined to handle advanced reactor licensing. The commenter states that much of the design information needed to develop an effective GEIS is not yet available, and may not be obtainable because advanced reactor developers are not yet prepared to share requisite design information with the public. The commenter additionally suggests that most of the environmental issues that could potentially be resolved generically at this time are not the primary issues driving licensing decisions. The commenter suggests that staff resources presently available to work on an advanced reactor GEIS might be more effectively directed at adapting environmental review infrastructure such as the Environmental Standard Review Plans (ESRPs, in NUREG-1555) to better address advanced reactor licensing.

Response: The NRC staff agrees conditions may not yet be ripe for starting a GEIS addressing all possible advanced reactor applications. The staff instead believes that staff effort could be most efficiently allocated to initiating a GEIS focused on small reactor projects using low quantities of environmental resources such as water or land. The staff recognizes that there is a need to update the ESRPs and other environmental review infrastructure to handle advanced reactor licensing applications, but the staff believes that much of the research needed to prepare the focused GEIS would concurrently help facilitate the needed infrastructure development. The staff does not believe that it is facing a choice between developing the focused GEIS or developing the requisite infrastructure upgrades; it instead believes that adequate resources will be available for both efforts at the optimal time. The staff is updating its infrastructure by developing interim staff guidance for micro-reactors and modernizing the ESRPs, and plans to include guidance for advanced reactors in the updated ESRPs. The staff believes that developing the focused GEIS would help streamline the environmental reviews for many of the contemplated smaller advanced reactor projects substantially more than would just upgrading the environmental review infrastructure. Additionally, the staff believes that developing a GEIS would likely attract greater attention from, and hence better information from, environmental stakeholders and the public than would infrastructure upgrades alone.

The staff agrees with the commenter that its traditional environmental review processes are inherently efficient, and the schedules for most new reactor licensing application reviews over the last decade were driven by safety rather than environmental issues. The staff also notes that many of the delays with recent environmental reviews were attributable to factors out of the staff's control, such as delays in receiving requisite design information or changes to design information once reviews started. However, the staff also believes that the current processes were developed to meet the environmental review needs of large reactor projects encompassing several hundred or thousands of acres of land, using large quantities of water

capable of substantially altering aquatic ecosystems, and employing large enough numbers of workers to substantially alter local economies and lifestyles.

E-mail Comment from U.S. Nuclear Industry Council, January 24, 2020 (Adams Accession No. ML20043F483)

Comment: The commenter expresses support for development and use of a GEIS addressing advanced reactors and outlines many of the efficiencies that could be gained. The commenter supports the notion of addressing three reactor size categories, as discussed by NRC staff at the January 8, 2020 public workshop; but the commenter suggests defining the three sizes using smaller land areas and encourages staff to recognize when environmental impacts might be small regardless of reactor size. The commenter also recognizes, and supports, the fact that staff may initiate the GEIS effort focusing only smaller size classes.

Response: The NRC staff agrees with the commenter that the environmental review process could be made more efficient by developing a GEIS. As staff performed early research during the exploratory process, it realized that optimal use of staff resources might be achieved by initiating a GEIS focused on smaller advanced reactor projects, retaining the ability to ultimately expand the effort to encompass certain types of larger reactor projects once more definitive design data becomes available. This realization led the staff to raise the possibility at the workshop of addressing three quantitatively-defined size categories of advanced reactor projects: small, intermediate, and large. Upon completion of the exploratory process, the staff now believes that the most efficient course of action is to immediately initiate a GEIS addressing smaller reactor projects that use only low quantities of environmental resources such as water or land, and to allow for eventual expansion of the GEIS effort to encompass certain categories of larger projects as more definitive design data becomes available.

Although the staff attempted to quantitatively bound the size categories at the workshop, the staff now believes that the projects covered in the GEIS should instead be bound by the potential significance of environmental impacts, as discovered through the research completed to prepare the GEIS. Furthermore, the staff now believes that the range of projects can be best defined using only two categories: smaller projects effectively addressed through a GEIS, and larger projects where most environmental issues require site-specific consideration.

Anonymous Comment dated January 23, 2020 (Adams Accession No. ML20030A096)

Comment: The commenter speaks about negotiations between the United States and Iran.

Response: No content in the comment pertains to environmental reviews or licensing of advanced nuclear reactors, and the comment is completely out of the scope for the advanced nuclear reactor GEIS exploratory process.

Snake River Alliance (Holly Harris) Comment, January 24, 2020 (Adams Accession No. ML2003A101)

Comment: The commenter asks NRC to not proceed with an advanced reactor GEIS. The commenter's position is that the definition of "advanced reactor" is too hypothetical and too broadly defined to allow for a meaningful generic analysis of environmental impacts, and that generic analyses could exclude key stakeholders from participation in environmental reviews. The commenter also asks that any GEIS effort exclude consideration of small modular nuclear

reactors such as the NuScale Power, LLC, reactor design. The commenter suggests that any consideration of the NuScale design would duplicate past effort.

Response: The NRC staff agrees with the commenter that insufficient data is presently available to justify the effort to prepare a GEIS addressing the totality of advanced reactor designs. The staff agrees that such an effort would rely too much on speculative assumptions to effectively reduce the work needed to complete environmental reviews for licensing actual projects once they are received. However, the staff believes that it can complete useful generic analyses of many categories of environmental impacts for small reactor projects that use only limited quantities of environmental resources such as water and land. Those analyses could be completed without requiring detailed design data. Furthermore, the staff would review future licensing applications referring to the GEIS for issues and for new and significant information requiring site-specific consideration beyond the GEIS.

Any GEIS developed by the staff would address potential reactor projects based on their possible environmental impacts and would not specifically exclude any specific technology such as that of NuScale. While the GEIS preparers would draw upon information collected from past analyses wherever appropriate, they would not repeat those analyses.

Kairos Power (Peter Hastings) Comment, January 24, 2020 (Adams Accession No. ML20030A103)

Comment: The commenter expresses support for development and use of a GEIS addressing advanced reactors and outlines many of the efficiencies that could be gained. The commenter further advocates the use of categorical exclusions and environmental assessments to address site-specific issues not adequately addressed through the GEIS. The commenter also encourages NRC to rely on the analyses of environmental analyses performed by appropriate state agencies instead of developing independent analyses, and the commenter encourages NRC to consider eliminating the opportunity for introducing environmental issues into contested adjudicatory hearings on environmental issues.

Response: The NRC staff agrees with the commenter that generic analyses of environmental impacts through a GEIS could make the environmental review process more efficient. However, the staff believes that the most efficient course of action is to initiate a GEIS focusing on small advanced reactor projects while maintaining the ability to ultimately expand the GEIS effort to encompass certain categories of larger advanced reactor projects. The commenter suggests NRC develop a “nationwide programmatic EIS” that resolves as many environmental issues as possible by drawing upon the collective environmental record of past reactor construction and operation. The staff, in contrast, believes that efficiencies can presently be attained only for small reactor projects and that it may be possible to expand generic environmental analyses to larger projects only once advanced reactor designs are more complete.

Current regulations in 10 CFR Part 51 encourage the staff to incorporate by reference analyses performed by other parties, including State or other federal agencies, and the staff does so when appropriate. However, the staff must ensure that any information incorporated by reference into an NRC document is accurate and properly interpreted. Other changes to NRC’s environmental review process, such as increasing the use of categorical exclusions or environmental assessments or changes to NRC’s adjudicatory processes, are not within the scope of the exploratory process for an advanced reactor GEIS.

Pia Jensen Comment, January 24, 2020 (Adams Accession No. ML20030A106)

Comment: The commenter states that there are too many issues that cannot be adequately addressed generically and that only a complete site-specific EIS can be effective. The commenter focuses primarily on reactor safety issues.

Response: The NRC staff agrees that there are some environmental issues for advanced reactors that can only be addressed effectively through a site-specific effort, especially for large reactor projects that use large quantities of environmental resources such as water or land. The staff will therefore initiate a GEIS that focuses on small advanced reactor projects use only small quantities of resources. Even though the staff may ultimately expand its generic effort to address certain categories of larger projects as designs become more mature, the staff would always rely on generic analyses only for issues satisfactorily addressed at the generic staff and would continue to evaluate incoming licensing applications for issues justifying site-specific analysis. The staff also notes that any GEIS would be used only in conjunction with the environmental review and would not influence NRC's concurrent safety review.

Uranium Watch (Sarah Fields) Comment, January 24, 2020 (Adams Accession No. ML20030A107)

Comment: The commenter recommends that NRC not move forward with developing a GEIS for advanced nuclear reactors. The commenter believes there is not yet enough specific information available on possible advanced reactor technologies and projects to support development of a GEIS meeting NEPA requirements. The commenter notes that much of the necessary design information will only be available for any given advanced reactor technology until applicants have prepared design certification applications. Furthermore, the commenter believes that the objectives of NEPA can only be met through site-specific environmental analyses for each proposed reactor project. The commenter expressed concern that local stakeholders could only be involved as part of a site-specific review and might be excluded from a generic consideration. Finally, the applicant states that the scope of any advanced reactor GEIS process not extend to small modular light water reactors.

Response: The NRC staff agrees that there is not yet enough specific design information to support development of a GEIS addressing all advanced nuclear reactor projects. The staff also agrees that there are certain issues that can be effectively addressed only through site-specific environmental review, and that there are certain stakeholders and experts who can only be engaged through site-specific effort. However, the staff does believe that enough information is currently available to generically address many environmental issues for small advanced reactor projects not involving use of large quantities of environmental resources such as water or land. If the environmental footprint of a project were sufficiently limited, the staff would not need detailed design data to conclude whether the impacts might be significant. Through a GEIS, the staff could use scientific theory to establish bounds on the quantities and characteristics of affected resources below which impacts would not generally be significant. For an application that references the GEIS, the NRC would conduct a site specific environmental review to resolve impacts not bounded by the GEIS and address new and significant information revealed by more mature design stages. The staff would then prepare any necessary supplemental NEPA documentation and engage stakeholders as necessary.

ClearPath (Nicholas McMurray) Comment, January 22, 2020 (Adams Accession No. ML20043F485)

Comment: The commenter reiterated the recommendation presented by ClearPath in a white paper dated February 19, 2019 calling on NRC to develop a GEIS addressing environmental reviews advanced nuclear reactors. The commenter emphasized that the GEIS should address all Generation III+ and IV reactor designs, including light water as well as non-light water technologies, and that the staff take advantage of information contained in previous NRC GEIS documents, especially the license renewal GEIS (NUREG-1437).

Response: The NRC staff believes that the most efficient course of action is to initiate a GEIS focusing on small advanced reactor projects while maintaining the ability to ultimately expand the GEIS effort to encompass certain categories of larger advanced reactor projects. The staff's approach follows many elements of the ClearPath recommendation expressed in the white paper but differs in that, at least initially, the GEIS effort would only address smaller projects using low quantities of environmental resources such as water or land. The staff believes that enough environmental issues can be addressed generically for small advanced reactor projects to justify initiating a GEIS effort now, but that not enough issues could currently be satisfactorily addressed at a generic level for larger reactor projects to justify the costs of the additional effort. The staff would however structure the GEIS effort and associated documentation in a flexible manner conducive to expanding the scope to certain categories of larger reactor projects as conceptual designs become more mature.

The staff agrees with the commenter that the GEIS effort can be extended to both non-light water and light-water technologies, and that any limitations of the GEIS would be based primarily on the size of the project or amount of resources used and not on the technology *per se*. The staff also agrees with the commenter that the GEIS effort would be facilitated by avoiding redundant effort already expressed in past GEIS documentation, especially the license renewal GEIS. The staff would incorporate by reference from past GEIS documents and other environmental documents where appropriate.

Steven Chanin Comment, November 18, 2019 (Adams Accession No. ML20043F497)

Comment: The commenter expresses support for revising regulations to improve the efficiency of NRC environmental reviews for advanced reactors.

Response: The NRC staff agrees that developing a GEIS for licensing advanced nuclear reactors would improve the efficiency of environmental reviews for those reactors. The staff believes that the greatest efficiency could be achieved by initiating a GEIS focused on small advanced reactor projects and maintaining the ability to ultimately expand the GEIS effort to encompass certain categories of larger projects. The staff notes, however, that the GEIS would be developed in the context of existing regulations and achieving the desired efficiencies would not necessarily require revising regulations.

Seth A. Hoedl Comment, January 24, 2020 (Adams Accession No. ML20044F511)

Comment: The commenter recommends that NRC undertake a public-comment and expert-based exploration of the environmental impacts of advanced nuclear reactors but not structure the process as a GEIS. The process would help educate the public regarding the possible environmental effects and benefits from advanced reactor technologies and thereby help win

what the commenter refers to as a “social license” for future development of advanced nuclear reactors. However, the commenter argues that it would not be possible to resolve enough environmental concerns generically at this time and that NRC should still prepare project-specific EISs upon receipt of future applications.

Response: The NRC staff agrees that a “public-comment and expert-based exploration” of the possible environmental effects from advanced reactors could help facilitate public acceptance of advanced reactor technologies. However, the staff believes that such a process could be effectively conducted in the framework of a GEIS. Based on its overall review of information, the staff believes that the most efficient approach is to initiate development of a GEIS focusing on small projects with low usage of environmental resources, maintaining an option to possibly expand the effort in the future to address some types of larger advanced reactor projects. The staff would strive to resolve as many environmental issues as possible generically through the GEIS but would still conduct tiered site-specific environmental reviews upon receipt of individual applications. Conducting the tiered reviews would avoid the possibility of overlooking issues not satisfactorily addressed generically.

Edwin Lyman (Union of Concerned Scientists) Comment, January 24, 2020 (Adams Accession No. ML20030A104)

Comment: The commenter expresses concern that the term “advanced reactor” is not clearly defined, and hence that the scope of any related GEIS would not be clearly defined. The commenter is also concerned that any definition of “advanced reactor” would encompass too disparate a breadth of reactor technologies to be effectively addressed in a GEIS, and that use of any such GEIS could exclude potentially significant environmental impacts from effective consideration.

Response: Advanced reactors can encompass a broad spectrum of varied technologies. For the purposes of a potential advanced reactor GEIS, “advanced reactor” or “advanced nuclear reactor” refers to non-light-water reactors that generate an output of 30 MWth or less. This usage is within the scope of the definition “advanced nuclear reactor” in the Nuclear Energy Innovation and Modernization Act (NEIMA; Public Law No. 115-439).

The staff agrees that it would currently be difficult to prepare a GEIS addressing the entire breadth of advanced reactor sizes and technologies. The staff therefore recommends preparing a GEIS addressing small advanced reactors using only limited quantities of environmental resources such as land and water. Such an effort could be expanded to encompass some categories of larger advanced reactors as more information on new technologies becomes available. Regardless of how many GEISs it prepares, the staff would still perform site-specific environmental reviews of each advanced reactor licensing application to identify site-specific data and any other new and significant information not satisfactorily analyzed through a GEIS.

Anonymous Comment dated January 23, 2020 (Adams Accession No.ML20030A097)

Comment: The commenter recommends that applicants not build any more nuclear reactors and instead work on clean energy sources to better protect the environment and public safety.

Response: The comment is not relevant to a decision by NRC whether to prepare a GEIS for advanced reactors.