



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

June 4, 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: William D. 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 MAY 3, 2018, PUBLIC MEETING TO DISCUSS  
REGULATORY IMPROVEMENTS FOR ADVANCED REACTORS

On May 3, 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 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML18116A248). 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. ML18130A688.

Mr. Steven Mirsky of NuScale Power, LLC provided a summary the licensing of the NuScale small modular reactor (SMR) and related insights for consideration by developers of non-light water reactor (non-LWR) designs. Key accomplishments described in the presentation included topical reports related to the highly integrated protection system, electrical power supplies, and emergency planning zones; alignment with NRC staff on failed fuel fractions; and a proposal to define "credible" in terms of regulatory requirements. Mr. Mirsky provided insights on the importance of pre-application interactions and emphasized the need to reach agreement on expectations and focus areas for those interactions. Many of the areas discussed are relevant to non-LWRs and the related policy and key technical areas under discussion. It was agreed that both NRC staff and industry groups would attempt to improve communications and coordination of activities associated with light-water SMRs and non-LWRs.

CONTACT: William D. Reckley, NRO/DSRA  
301-415-7490

Dr. George Flanagan provided a summary of discussions from the workshop to develop a strategic vision for advanced reactor standards held on May 2, 2018 (ADAMS Accession No. ML18095A101). The workshop was organized by the NRC staff and the American Nuclear Society (ANS). Dr. Flanagan described the highlights from the workshop, including participant discussions related to (1) American Society of Mechanical Engineers (ASME) efforts to develop a standard to support high temperature reactors by accepting a limited number of materials; (2) questions related to defining quality assurance expectations for equipment categorized as nonsafety related but warranting special treatment; (3) issues related the use of refractory materials, cladding, and coatings not covered by ASME; (4) testing and surveillances for new types of equipment that might be used in non-LWRs; (5) nuclear standards for concrete subject to high temperature environments; and (6) the use of higher assay low enriched uranium. Workshop participants were said to have generally agreed that performance-based approaches were preferred over more prescriptive types of standards. A summary of the workshop will be prepared by the ANS and made available through their website.

Mr. Trevor Cook of the DOE's Office of Nuclear Energy provided a summary of advanced reactor activities. The presentation addressed focus areas for the non-LWR technologies (fast, gas, and molten salt) as well as cross-cutting technologies, including mention of micro reactors for remote defense and commercial applications. Mr. Cook also provided an update on DOE's consideration of a versatile test reactor and plans to use funds included in the omnibus spending bill to reach critical decision 0 (mission need) in early 2019.

Mr. Randy Belles of Oak Ridge National Laboratory (ONRL) led a discussion related to a report providing possible guidance for preparing and reviewing applications for the licensing of nonpower reactors using molten salt technologies. The report was released on May 4, 2018 (ADAMS Accession No. ML18124A330). The presentation described the format and content of the report, which follows the general outline of NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," and interim staff guidance related to aqueous homogeneous reactors (ADAMS Accession Nos ML12156A069 and ML12156A075). Mr. Belles explained that molten salt reactor technologies required some deviations from the established organization and terminology in NUREG-1537, as well as introducing some unique issues such as delayed neutron drift and fuel salt chemistry. The NRC staff plans to use the ONRL report as a starting point to assess the need for and possible development of more formal guidance for molten salt reactor nonpower reactor applications.

Mr. Ian Jung of the NRC staff provided a presentation and led discussions on the use of safety-focused reviews in the area of instrumentation and control (I&C). Mr. Jung noted that current requirements and guidance were prepared for large light-water reactors and the expected review of advanced reactor designs provides an opportunity for improvements to simplify applications and reviews and make them more safety focused and risk informed. Current activities for the review of the NuScale SMR included preparing a design-specific review standard and the enhanced safety-focused review process discussed in previous stakeholder meetings. The process used for I&C has improved the efficiency and reduced the number of requests for additional information during the review of the NuScale application.

Mr. Jason Redd of Southern Company provided a status of the application guidance document being prepared under the Licensing Modernization Project (LMP) (ADAMS Accession No. ML18094B085) and the related comments and questions from the NRC staff (ADAMS Accession No. ML18120A321). The LMP is preparing a revision for distribution to developers for review and comment. An NRC public meeting on the revision is tentatively planned for early June 2018. The draft guidance document is the topic of a meeting of the Future Plant Designs Subcommittee of the Advisory Committee on Reactor Safeguards on June 19, 2018. The NRC staff requested that stakeholders identify additional guidance documents that would be complimentary to the LMP activities to define content of applications or otherwise needed to support an integrated approach to the licensing and regulation of non-LWRs.

Mr. Peter Hastings of Kairos Power led a discussion on efforts to complete and issue additional industry guidance related to regulatory engagement plans (REPs). The latest draft of the NEI guidance document and related NRC staff comments are available under ADAMS Accession No. ML18122A293. The NRC staff provided comments on the draft because the subject matter is regulatory engagement but formal NRC approval or endorsement was not requested. Mr. Hastings explained that most of the staff's comments would be addressed and then the REP guidance document would be published.

Ms. Kati Austgen of NEI led a discussion on siting considerations related to population. This topic and a related NRC draft white paper (ADAMS Accession No. ML17333B158) was discussed during the stakeholder meeting held on December 14, 2017. The feedback from NEI's Advanced Reactor Regulatory Task Force and SMR Working Group is that Regulatory Guide 4.7, "General Site Suitability Criteria for Nuclear Power Stations," should be revised to scale siting considerations with source term, similar to proposed emergency planning zones, and other factors related to timing and probability of possible releases. Ms. Austgen stated that the NEI groups are gathering resources and assessing next steps, with the intention of preparing a paper to support future interactions with the NRC staff. The staff will likewise continue to assess this issue and investigate possible changes to guidance documents to better reflect the potential risks posed by non-LWR and SMR designs.

The meeting ended with a discussion of other topics and future meetings. The staff supported a short discussion of the non-LWR policy table and noted several minor updates and corrections. An updated table is provided under ADAMS Accession No. ML18130A949. The date of the next meeting is tentatively scheduled for June 14, 2018. Likely agenda topics for the next meeting include status of NRC proposed rulemaking on emergency planning zones for SMRs and other new technologies, fuel cycle and transportation packages for non-LWR fuels, environmental reviews, and use of legacy data from past DOE development programs (e.g. EBR II for qualification of metal fuel).

Enclosure:  
As stated

SUMMARY OF MAY 3, 2018, PUBLIC MEETING TO DISCUSS TO DISCUSS REGULATORY IMPROVEMENTS FOR ADVANCED REACTORS-DATED June 4, 2018.

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