

REGULATORY ANALYSIS

DRAFT REGULATORY GUIDE DG-1404 GUIDANCE FOR A TECHNOLOGY-INCLUSIVE CONTENT OF APPLICATION METHODOLOGY TO INFORM THE LICENSING BASIS AND CONTENT OF APPLICATIONS FOR LICENSES, CERTIFICATIONS, AND APPROVALS FOR NON-LIGHT WATER REACTORS

(Proposed new regulatory guide RG 1.253)

1. Statement of the Problem

The U.S. Nuclear Regulatory Commission (NRC) is considering issuing a new Regulatory Guide (RG) to provide guidance to designers, applicants, and licensees for non-light water reactors (non-LWRs), for developing applications following the licensing modernization project (LMP) process. The proposed guidance will facilitate the development and review of a non-LWR applications for construction permits (CPs) or operating licenses (OLs) under Title 10 of the Code of Federal Regulations (10 CFR) Part 50, “Domestic Licensing of Production and Utilization Facilities” (Ref. 1), or for combined licenses (COLs), manufacturing licenses (MLs), standard design approvals (SDAs), or design certifications (DCs) under 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants” The NRC staff intends to revise this proposed guidance as a part of the ongoing rulemaking for 10 CFR Part 53, “Licensing and Regulation of Advanced Nuclear Reactors” (RIN 3150 AK31).

The requirements in 10 CFR 50.34, 52.47, 52.79, 52.137, and 52.157 state that an application for a CP, OL, DC, COL, SDA, and ML, respectively, must include a safety assessment of the facility, describe the safety features engineered into the facility, and information describing appropriate programmatic controls for design, construction, and operation of the facility. Similar requirements are being considered as part of the development of the 10 CFR Part 53 rulemaking effort.

To standardize the development of content within a non-LWR application, the NRC staff focused on two activities: the Advanced Reactor Content of Application Project (ARCAP) and the Technology-Inclusive Content of Application Project (TICAP). The ARCAP is an NRC-led activity that is intended to result in guidance for a complete non-LWR application for review under 10 CFR Part 50 or 10 CFR Part 52, and which the staff would update if the Commission issues a final 10 CFR Part 53 rule. As a result, the ARCAP is broad and encompasses several industry-led, and NRC-led guidance document development activities aimed at facilitating a consistent approach to the development of application documents.

The TICAP is an industry-led activity that is focused on providing guidance on the appropriate scope and depth of information related to the specific portions of the safety analysis report that describe the fundamental safety functions of the design and documents the safety analysis of the facility using the LMP-based approach. The LMP-based approach is described in RG 1.233, “Guidance for a Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors.”

It is proposed that DG-1404, “Guidance for a Technology-Inclusive Content of Application Methodology to Inform the Licensing Basis and Content of Applications for Licenses,

Certifications, and Approvals for Non-Light-Water Reactors” provide a general overview of the information that should be included for the LMP-based portion of a non-LWR application. The DG is based on NEI 21-07, Revision 1, “Technology Inclusive Guidance for Non-Light-Water Reactors, Safety Analysis Report Content for Applicants Using the NEI 18-04 Methodology.” NEI 21-07, Revision 1, describes an approach to develop the scope and content of major portions of the safety analysis report for an application by implementing the LMP methodology described in NEI 18-04, Revision 1, “Risk-Informed Performance-Based Guidance for Non-Light Water Reactor Licensing Basis Development,” as endorsed by the NRC in RG 1.233. The LMP methodology provides a process for selecting licensing basis events, classifying structures, systems, and components, and assessing defense-in-depth adequacy.

2. Objective

The objective of this regulatory action is to provide guidance on using a technology-inclusive, risk-informed, and performance-based methodology to inform the licensing basis and content of applications for licenses, certifications, and approvals for non-LWRs required by 10 CFR Parts 50 and 52. The NRC staff intends to revise this guidance as a part of the ongoing rulemaking for 10 CFR Part 53.

3. Alternative Approaches

The NRC staff considered the following alternative approaches:

1. Do not develop Draft Regulatory Guide titled “Guidance for a Technology-Inclusive Content of Application Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors”
2. Develop Draft Regulatory Guide titled “Guidance for a Technology-Inclusive Content of Application Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors”

Alternative 1: Do not develop Draft Regulatory Guide titled “Guidance for a Technology-Inclusive Content of Application Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors”

Under this alternative, the NRC staff would not develop the Draft Regulatory Guide, and the current guidance, which was developed for large light-water reactor (LWR) designs, would be retained. This alternative is considered the “no-action” alternative and provides a baseline condition from which any other alternatives will be assessed. The “no-action” alternative would not address how the current large LWR-focused guidance could be adapted to address the unique design features related to non-LWR technologies or the LMP methodology. Each applicant for a non-LWR design or facility would prepare applications independent of guidance and the NRC would review each application on a case-by-case basis, which would extend the time required to prepare and review each application and potentially result in excessive costs and delays in licensing non-LWRs following the LMP methodology.

Alternative 2: Develop Draft Regulatory Guide titled “Guidance for a Technology-Inclusive Content of Application Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors”

Under this alternative, the NRC would develop the Draft Regulatory Guide. This initial issuance would provide designers, applicants, and licensees of non-LWRs using the LMP

methodology with guidance that is risk-informed, technology-inclusive, and performance-based and would include guidance for identifying licensing basis events, classifying structures, systems, and components (SSCs) and their performance criteria, and assessing defense-in-depth to support applications required by 10 CFR Parts 50 and 52. This guidance would also be used to inform guidance development for the 10 CFR Part 53 rulemaking. By doing so, the NRC would ensure that the guidance available in this area is current and accurately reflects the NRC staff's position.

The impact to the NRC would be the costs associated with preparing and issuing the new regulatory guidance for non-LWR designs using the LMP methodology that is risk-informed, technology-inclusive, and performance-based. The impact to the public would be the voluntary costs associated with reviewing and providing comments to NRC during the public comment period. The value to NRC staff and its applicants would be the benefits associated with enhanced efficiency and effectiveness in using a common guidance document as the technical basis for license applications and other interactions between the NRC and its regulated entities. The costs to applicants and licensees of implementing the revised guidance are justified by the benefits accrued with the use of a guidance document that is risk-informed, technology-inclusive, and performance-based that can be used to develop non-LWR applications that are different than the large LWR reactors on which the current guidance is based. Further, the NRC staff anticipates that the revised guidance would streamline the NRC staff's review of non-LWR applications (i.e., relative to a case-by-case basis review due to no guidance or outdated guidance) and therefore result in the least-cost alternative for reviewing non-LWR applications.

Conclusion

Based on this regulatory analysis, the NRC staff concludes that issuance of DG-1404, "Guidance for a Technology-Inclusive Content of Application Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors" is warranted. The action will enhance the ability of non-LWR designers, applicants, and future licensees using the LMP methodology to prepare applications for their new, innovative, and non-LWR based designs. It could also lead to cost savings for the industry and time savings for the NRC staff, especially regarding the development or review of an application for a CP, OL, DC, COL, SDA, or ML associated with a non-LWR design.