

# REGULATORY ANALYSIS

## DRAFT REGULATORY GUIDE (DG)-1330 GUIDANCE FOR DEVELOPING PRINCIPAL DESIGN CRITERIA FOR NON-LIGHT WATER REACTORS

(Proposed new regulatory guide (RG) 1.232)

### 1. Statement of the Problem

The U.S. Nuclear Regulatory Commission (NRC) is considering issuing a new regulatory guide (RG) to provide designers, applicants, and licensees of non-light water reactors guidance for developing principal design criteria (PDC), as required by Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50 “Domestic Licensing of Production and Utilization Facilities” (10 CFR Part 50).

The requirements in 10 CFR 50.34(a)(3)(i), 52.47(a)(3)(i), 52.79(a)(4)(i), 52.137(a)(3)(i) and 52.157(a) state that an application for a construction permit, design certification, combined license, standard design approval, or manufacturing license respectively, must include the PDC for the facility. The PDC are derived from the general design criteria (GDC) in Appendix A, “General Design Criteria for Nuclear Power Plants,” to 10 CFR Part 50. The current GDC are applicable to light water cooled nuclear reactor (LWR) designs and contain aspects that do not directly apply to non-light water cooled reactor (Non-LWR) designs. The introduction in Appendix A to 10 CFR Part 50 states that the GDC are “...also considered to be generally applicable to other types of nuclear power units and are intended to provide guidance in establishing the principal design criteria for such other units.”

In July 2013, the NRC and U.S. Department of Energy (DOE) established a joint initiative to address a key element in the regulatory framework that could apply to non-LWR technologies specifically addressing the existing GDC. This initiative was established to address mounting interest in commercializing non-LWR technologies by non-LWR industry stakeholders. The purpose of the initiative was to assess the GDC to determine whether they apply to non-LWR designs and if not, to propose modifications to address the design features unique to non-LWRs. In each case, the underlying safety objectives of the GDC still apply. These non-LWR design criteria are intended to assist the staff, designers, applicants, and future licensees. The work completed by this initiative is appropriate to be captured in the NRC’s regulatory framework.

### 2. Objective

The objective of this regulatory action is to provide guidance on how the GDC in Appendix A, of 10 CFR Part 50 apply to non-LWR designs. This proposed regulatory guidance will also describe the NRC’s proposal for modifying and supplementing the GDC to address two specific non-LWR design concepts: sodium-cooled fast reactors (SFRs), and modular high temperature gas-cooled reactors (mHTGRs). This proposed guidance may be used by all non-LWR reactor designers, applicants, and licensees as guidance for the development of PDC for non-LWR designs, as required by 10 CFR Parts 50 and 52.

### **3. Alternative Approaches**

The NRC staff considered the following alternative approaches:

1. Do not develop new regulatory guidance
2. Develop new regulatory guidance

#### **Alternative 1: Do Not Develop New Regulatory Guidance**

Under this alternative, the NRC would not develop guidance, and the current guidance 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 LWR focused GDC should be adapted to address the unique design features related to non-LWR technologies. The NRC staff would be required to review each non-LWR application on a case-by-case basis, which would increase the time and cost required to review an application and potentially result in excessive delays in licensing Non-LWR designs. The time and cost of individual reviews for non-LWR designs cannot be determined at this time due the multiple and varied types of reactor designs being proposed.

#### **Alternative 2: Develop New Regulatory Guidance**

Under this alternative, the NRC would develop a new regulatory guide (DG-1330). This new regulatory guide would provide designers, applicants, and licensees of non-LWRs guidance for developing PDC, as required by 10 CFR Parts 50 and 52. By doing so, the NRC would ensure that the guidance available in this area is current and accurately reflects the position of the NRC staff.

The impact to the NRC would be the costs associated with preparing and issuing the new regulatory guide. 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.

Use of a common guidance document will improve efficiency by reducing the NRC staff review time which results in a lower cost of the review. Determination of review times or cost estimates are not possible at this time because of the wide variety of non-LWR designs being proposed and the lack of historical cost information on non-LWR reviews.

### **Conclusion**

Based on this regulatory analysis, the NRC staff concludes that issuance of a new regulatory guide is warranted. The action will enhance the ability of non-LWR designers, applicants, and future licensees to establish PDC for their new and innovative designs. It could also lead to cost savings for the industry and time savings for the NRC staff, especially with regard to developing or reviewing an application for a construction permit, design certification, combined license, standard design approval, or manufacturing license.