REGULATORY ANALYSIS

DRAFT REGULATORY GUIDE DG-1392

SITE CHARACTERIZATION INVESTIGATIONS FOR NUCLEAR POWER PLANTS

(Proposed Revision 3 of Regulatory Guide (RG) 1.132, dated October 2003)

1. Introduction

This document presents the results of a regulatory analysis of the U.S. Nuclear Regulatory Commission's (NRC's) determination of whether to issue Draft Regulatory Guide (DG) 1392, "Site Characterization Investigations for Nuclear Power Plants." The analysis provides the public with an insight in how the NRC arrives at a decision.

2. Statement of the Problem

The Nuclear Regulatory Commission (NRC) issued revision 2 of RG 1.132 "Site Characterization Investigations for Nuclear Power Plants" in October 2003 per requirement of regulation Title 10, of the Code of Federal Regulations, Part 100.23 "Geologic and seismic siting criteria" (10 CFR 100.23) for stationary power reactor site applications on or after January 10, 1997. This RG provides licensees and applicants with agency-approved guidance for complying with the 10 CFR 100.23 criteria. Since issuance of Revision 2 there have been revisions of U.S. Army Corps of Engineer site investigation manuals upon which the guide is based. In addition, RG 1.165 "Identification and Characterization of Seismic Sources and Determination of Safe Shutdown Earthquake Ground Motion," cited in Revision 2 was withdrawn in 2010 and it was replaced in this revision by RG 1.208, "A Performance-Based Approach to Define the Sites-Specific Earthquake Ground Motion." The methods found in RG 1.132 play an important role in determination of site-specific ground motion and the guide needs to be updated to capture technology changes in the geotechnical engineering field since 2003.

3. Objective

The objective of this regulatory action is to access the need to update NRC guidance on special requirements in site characterization investigation related to SMR design, application of new technologies and methodologies in site characterization investigations, and implementation of the NRC's risk-informed, performance-based approach for regulation. The revised RG 1.132 will provide applicants with a better guidance in compliance with the 10 CFR Part 100.23 requirements for site characterization investigation for nuclear power plants.

4. Identification and Analysis of Alternative Approaches

The NRC staff considered the following alternative approaches:

1. Do not revise Regulatory Guide 1.132.
2. Withdraw Regulatory Guide 1.132.
3. Revise Regulatory Guide 1.132.

Alternative 1: Do Not Revise Regulatory Guide 1.132

Under this alternative, the NRC would not revise this RG, and the current guidance would be retained. This "no-action" alternative would provide a baseline condition from which any other alternatives will be assessed. The "no-action" alternative would not address identified concerns with the current version of the regulatory guide, and therefore it may result in NRC issuing requests for additional information (RAIs) to applicants when non-conventional nuclear power plant designs are involved in applications, which would create burdens to both the applicants and staff for the efforts of responding to the RAIs and reviewing the RAI responses, and might result in a need of additional site investigation work to complete the review of applications.

Alternative 2: Withdraw Regulatory Guide 1.132

Under this alternative the NRC would withdraw this regulatory guide. This action would not solve the problems identified above regarding the current version of the RG but eliminate the readily available description of some site characterization investigation methods that the NRC staff considers acceptable for demonstrating compliance with 10 CFR 100.23. Withdrawing the RG 1.132 will increase the cost because without the guidance, the applicants would need to justify the methods and procedures used in their applications, and the NRC staff's review may result in an increase in the number of RAIs, which could extend the length of the review and might result in a need of additional site investigation work to complete the review of applications.

Alternative 3: Revise Regulatory Guide 1.132

Under this alternative, the NRC would revise Regulatory Guide 1.132. This revision would incorporate the special requirements related to SMR design in site characterization investigation, application of new technologies and methodologies in site characterization investigations, and implementation of the NRC's risk-informed, performance-based approach for regulation. By doing so, the NRC would ensure that the RG guidance available in this area is current, and accurately reflects the staff's position.

The impact to the NRC would be the costs associated with preparing and issuing the regulatory guide revision. 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 applicants would be the benefits associated with enhanced efficiency and effectiveness in using a common guidance that is in compliance with related regulations for license applications and other interactions between the NRC and its regulated entities. New applications and amendments would benefit from the updated guidance by reducing the need for RAIs and eliminate possible additional site investigation work after submission of applications.

5. Comparison of Alternatives

The three alternatives were compared against each other.

Alternative 1 and 2 do not solve the problems identified above regarding the current version of the RG. Alternative 3 would be superior to Alternative 1 and possibly 2 in that it would update the RG to include revised standards and procedures to incorporate the special requirements in

site characterization investigation related to SMR design, application of new technologies and methodologies in site characterization investigations, and implementation of the NRC's risk-informed, performance-based approach for regulation.

With regard to NRC resources, Alternative 3 represents the greatest initial cost to the NRC, which is attributable to the costs associated with preparing and issuing a revised guide. However, when considered over the lifetime of the RG, the potential for additional staff resources needed for issuing additional RAIs and reviewing RAI responses, the overall cost of Alternative 3 is expected to be less than that of Alternatives 1 or 2.

With regard to applicant resources, Alternative 3 will result in the cost savings because the reduced efforts on responding to potential additional RAIs and eliminating possible additional site investigation activities after application being submitted.

6. Decision Rationale

Based on this regulatory analysis, the NRC staff concludes that revision of RG 1.132 is warranted. This action will enhance reactor safety by providing better site characterization for site, foundation, and structure stability evaluations, regardless it is a conventional or advanced reactor design. It could also lead to cost savings for the industry, especially with regard to combined license and construction permit applications for non-conventional reactor designs.