REGULATORY ANALYSIS

1. STATEMENT OF THE PROBLEM

Revision 1 of Regulatory Guide 1.132, ”Site Investigations for Foundations of Nuclear Power Plants” was issued in March 1979. It describes acceptable methods for complying with the Commission’s regulations with respect to determining geological, engineering, and hydrological characteristics of a prospective plant site for the purpose of evaluating safety and design of foundations and earthworks. In the intervening time, both the practice of geotechnical field investigations and the NRC regulations for plant siting have changed.

New regulations were issued: Subpart B, “Evaluation Factors for Stationary Power Reactor Site Applications on or After January 10, 1997," of 10 CFR Part 100. The new regulations have a major impact on seismic siting criteria, which necessitated revising Regulatory Guide 1.165 in March 1997. While the impact on geotechnical site investigations is much smaller, it is still advisable to revise the related guidance in Regulatory Guide 1.132. This is particularly so, because many of the practices in field investigations have changed. Among the notable changes are an increased use of geophysical methods, and the newly developed Global Positioning System (GPS) surveying methods, together with the use of computer-based Geographic Information Systems (GIS). Some of the ASTM standards related to borehole drilling and in situ test procedures have also been changed.

In the staff’s view, a revision to Regulatory Guide 1.132 would promote the use of newer and more efficient methods of investigation, providing a better basis for evaluating site safety with respect to foundation design for critical structures.

2. OBJECTIVE

The objective of this regulatory action is to update NRC guidance on geotechnical site investigations for the design of foundations and earthworks to conform with new regulations and practices.

3. ALTERNATIVES AND CONSEQUENCES OF THE PROPOSED ACTION

3.1 Alternative 1 (Do not revise Regulatory Guide 1.132)

Under this alternative, license applications for nuclear power plants submitted after January 10, 1997, would continue to be based on the practices of over 20 years ago, as far as geotechnical site investigations are concerned. Some future applicants may, on their own initiative, use more modern procedures, but would not be required to do so. This alternative is considered the baseline, or no action, alternative.

3.2 Alternative 2 (Revise Regulatory Guide 1.132)

Alternative 2 would have the following consequences.

(1) Benefits. Conducting investigations with newer methodologies and specifications is expedient because this represents the present practice in the industry. Other benefits to be

derived from the new guidance include better or less costly design and reduced risk from better designed plants.

(2) Costs. Costs would not be expected to change because no new or different types of investigations are specified. Geophysical methods of site exploration have been added; Revision 1 of the guide only mentioned geophysical investigations peripherally, together with borehole geophysical logging. While including geophysical methods could be considered an additional recommendation, it is the present state of practice in that these methods are being used today in virtually any large site investigation of a geological engineering nature. The reason for using geophysical methods is to reduce the costs of the overall investigation, because the only other way to get the same amount of information about the subsurface is to conduct additional drilling and borehole testing, which is the most expensive part of site investigations. Thus, the inclusion of geophysical methods tends to lower the cost of the site investigation.

A second recommendation that has been added is the use of a Geographic Information System in conjunction with surveying via the Global Positioning System. Again, these items have become standard practice because they generally simplify surveying procedures and the recording and displaying of spatial information. This recommendation should, therefore, not increase overall costs.

4. CONCLUSION

Based on the regulatory analysis, it is recommended that this revision to Regulatory Guide 1.132 be issued. This revision of the regulatory guide should be beneficial because it may lead to safer plant designs, whereas the costs of the investigations should decrease or at least not materially increase. The staff sees no adverse effects associated with the revision.

BACKFIT ANALYSIS

The regulatory guide does not require a backfit analysis as described in 10 CFR 50.109(c) because it does not impose a new or amended provision in the NRC's rules or a regulatory staff position interpreting the NRC's rules that is either new or different from a previous applicable staff position. In addition, this regulatory guide does not require the modification or addition to systems, structures, components, or design of a facility or the procedures or organization required to design, construct, or operate a facility. Rather, an applicant can select a preferred method for achieving compliance with a license or the rules or the orders of the Commission as described in 10 CFR 50.109(a)(7). This regulatory guide provides an opportunity to use industry-developed standards, if that is the applicant's preferred method.