[7590-01-P]

U.S. NUCLEAR REGULATORY COMMISSION

Draft Regulatory Guide: Issuance, Availability

The U.S. Nuclear Regulatory Commission (NRC) has issued for public comment a draft revision to an existing guide in the agency's Regulatory Guide Series. This series has been developed to describe and make available to the public such information as methods that are acceptable to the NRC staff for implementing specific parts of the NRC's regulations, techniques that the staff uses in evaluating specific problems or postulated accidents, and data that the staff needs in its review of applications for permits and licenses.

Draft Revision 1 of Regulatory Guide 1.76, entitled "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants," is temporarily identified by its task number, DG-1143, which should be mentioned in all related correspondence. This proposed revision provides licensees and applicants with new guidance that the NRC staff considers acceptable for use in selecting the design-basis tornado and design-basis tornado-generated missiles that a nuclear power plant should be designed to withstand in each of the three regions within the contiguous United States to prevent undue risk to the health and safety of the public.

By contrast, the predecessor to this revision, entitled "Design-Basis Tornadoes for Nuclear Power Plants," did not include guidance on the selection of design-basis tornado-generated missiles. Such missiles were previously addressed in Section 3.5.1.4, "Missiles Generated by Natural Phenomena," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants" (SRP). With this draft Revision 1 of Regulatory Guide 1.76, the staff added related guidance for licensees and applicants because the Standard Review Plan (SRP) is intended to provide guidance to NRC reviewers, rather than licensees and applicants.

In particular, General Design Criterion (GDC) 2, "Design Bases for Protection Against Natural Phenomena," of Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10, Part 50, of the Code of Federal Regulations (10 CFR Part 50), requires that

structures, systems, and components that are important to safety must be designed to withstand the effects of natural phenomena such as tornadoes without loss of capability to perform their safety functions. GDC 2 also requires that the design bases for these structures, systems, and components shall reflect (1) appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena, and (3) the importance of the safety functions to be performed.

Additionally, GDC 4, "Environmental and Dynamic Effects Design Bases," of Appendix A to 10 CFR Part 50 requires, in part, that structures, systems, and components that are important to safety must be protected against the effects of missiles from events and conditions outside the plant.

In addition, for stationary power reactor site applications submitted before January 10, 1997, Paragraph 100.10c(2) of 10 CFR Part 100, "Reactor Site Criteria," states that meteorological conditions at the site and in the surrounding area should be considered in determining the acceptability of a site for a power reactor.

By contrast, for stationary power reactor site applications submitted on or after January 10, 1997, Paragraph 100.20c(2) of 10 CFR Part 100 requires that meteorological characteristics of the site that are necessary for safety analysis or may have an impact upon plant design (such as maximum probable wind speed) must be considered in determining the acceptability of a site for a nuclear power plant. In addition, Paragraph 100.21(d) of 10 CFR Part 100 requires that the physical characteristics of the site, including meteorology, must be evaluated and site parameters established such that potential threats from such physical characteristics will pose no undue risk to the type of facility proposed to be located at the site.

The essence of these requirements is that nuclear power plants must be designed so that the plants remain in a safe condition in the event of the most severe tornado that can reasonably be predicted to occur at a site as a result of severe meteorological conditions. The original version of Regulatory Guide 1.76, published in April 1974, was based on WASH-1300, "Technical Basis for Interim Regional Tornado Criteria," which the NRC (then the Atomic Energy Commission) published in May 1974. WASH-1300 chose the design-basis tornado wind speeds so that the probability of occurrence of a tornado that exceeded the design-basis was on the order of 10^{-7} per year per nuclear power plant. WASH-1300 used 2 years of observed tornado intensity data (1971 and 1972) to derive design-basis tornado characteristics for three regions within the continental United States.

By contrast, the design-basis tornado wind speeds presented in this draft regulatory guide are based on Revision 1 to NUREG/CR-4461, "Tornado Climatology of the Contiguous United States," which the NRC published in April 2005. The tornado database used in the revised NUREG/CR-4461 includes information recorded for more than 46,800 tornado segments occurring from January 1, 1950, through August 31, 2003. More than 39,600 of those segments had sufficient information on location, intensity, length, and width to be used in the analysis of tornado strike probabilities and maximum wind speeds. The methods used in this analysis are similar to those used in the analysis of the initial tornado climatology leading to initial publication of NUREG/CR-4461 in 1986, with the addition of a term to account for finite dimensions of structures (sometimes called the "lifeline" term), as well as consideration of the variation of wind speeds along and across the tornado footprint. The basic idea is that, for finite structures, a tornado striking any point on the structure can cause damage. (The original NUREG/CR-4461 used a point model, where the nuclear power plant was assumed to be a point structure. Therefore, including the finite dimensions of structures increases the tornado strike probability.)

Draft Regulatory Guide DG-1143 does not address the determination of the design-basis tornado and tornado missiles for sites located in Alaska, Hawaii, or Puerto Rico; such determinations will be evaluated on a case-by-case basis. This guide also does not identify the specific structures, systems, and components that should be designed to withstand the effects of the design-basis tornado or should be protected from tornado-generated missiles and remain functional. In addition, this guide does not address the missiles attributable to extreme winds, such as hurricanes, which the NRC staff will consider on a case-by-case basis when identified.

To accompany Draft Regulatory Guide DG-1143, the NRC is issuing updates to proposed Revision 3 of Section 2.3.1, "Regional Climatology," and Section 3.5.1.4, "Missiles Generated by Tornadoes and Extreme Winds," of the SRP, which the staff previously issued for public comment in April 1996. These sections of the SRP relate to Draft Regulatory Guide DG-1143, in that all three documents concern the compliance of nuclear power plant designs with GDCs 2 and 4 for severe weather phenomena. However, Draft Regulatory Guide DG-1143 provides practices and principles for the benefit of licensees and applicants, while SRP Sections 2.3.1 and 3.5.1.4 provide guidance to NRC reviewers. The latest updates to SRP Section 2.3.1 (1) modify the scope of the severe weather phenomena that should be addressed by applicants for construction permits, operating licenses, early site permits, and combined licenses; (2) include new data sources that should be used in reviewing the information provided by the license applicants; and (3) clarify the review guidance. By contrast, the changes to SRP Section 3.5.1.4 include deleting the specifications for design-basis tornado missiles, since that information is now provided in Draft Regulatory Guide DG-1143.

The NRC staff is soliciting comments on Draft Regulatory Guide DG-1143, as well as SRP Sections 2.3.1 and 3.5.1.4. Please mention the relevant document identifiers (DG-1143, SRP 2.3.1, and/or SRP 3.5.1.4) in the subject line of your comments; comments may be accompanied by relevant information or supporting data. Comments submitted in writing or in electronic form will be made available to the public in their entirety through the NRC's

Agencywide Documents Access and Management System (ADAMS). Personal information will not be removed from your comments. You may submit comments by any of the following methods.

Mail comments to: Rules and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

Email comments to: NRCREP@nrc.gov. You may also submit comments via the NRC's rulemaking Web site at http://ruleforum.llnl.gov. Address questions about our rulemaking Web site to Carol A. Gallagher (301) 415-5905; email CAG@nrc.gov.

Hand-deliver comments to: Rules and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission, 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 a.m. and 4:15 p.m. on Federal workdays.

Fax comments to: Rules and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission at (301) 415-5144.

Requests for technical information about Draft Regulatory Guide DG-1143 and/or SRP Sections 2.3.1 and 3.5.1.4 may be directed to Dr. Arthur J. Buslik at (301) 415-6184 or by email to AJB@nrc.gov, or Jin-Sien Guo at (301) 415-1816 or by email to JSG@nrc.gov.

Comments would be most helpful if received by **March 27, 2006**. Comments received after that date will be considered if it is practical to do so, but the NRC is able to ensure consideration only for comments received on or before this date. Although a time limit is given, comments and suggestions in connection with items for inclusion in guides currently being developed or improvements in all published guides are encouraged at any time.

Electronic copies of Draft Regulatory Guide DG-1143 are available through the NRC's public Web site under Draft Regulatory Guides in the Regulatory Guides document collection of the NRC's Electronic Reading Room at http://www.nrc.gov/reading-rm/doc-collections/. Similarly, electronic copies of SRP Sections 2.3.1 and 3.5.1.4 are available at http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0800/#c2 and http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0800/#c3, respectively. In addition,

electronic copies of the three draft documents are available in the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html, under Accession #ML053140225 (DG-1143), #ML053570372 (SRP Section 2.3.1), and #ML053570376 (SRP Section 3.5.1.4).

Regulatory guides are also available for inspection at the NRC's Public Document Room (PDR), which is located at 11555 Rockville Pike, Rockville, Maryland; the PDR's mailing address is USNRC PDR, Washington, DC 20555-0001. The PDR can also be reached by telephone at (301) 415-4737 or (800) 397-4205, by fax at (301) 415-3548, and by email to PDR@nrc.gov. Requests for single copies of draft or final guides (which may be reproduced) or for placement on an automatic distribution list for single copies of future draft guides in specific divisions should be made in writing to the U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Reproduction and Distribution Services Section; by email to DISTRIBUTION@nrc.gov; or by fax to (301) 415-2289. Telephone requests cannot be accommodated.

Regulatory guides are not copyrighted, and Commission approval is not required to reproduce them.

(5 U.S.C. 552(a))

Dated at Rockville, Maryland, this 17th day of January, 2006.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION,

/RA/

Richard J. Barrett, Deputy Director
Division of Risk Analysis and Applications
Office of Nuclear Regulatory Research