

## U.S. NUCLEAR REGULATORY COMMISSION

### Regulatory Guide: Issuance, Availability

The U.S. Nuclear Regulatory Commission (NRC) has issued a new 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.

Regulatory Guide 1.204, "Guidelines for Lightning Protection of Nuclear Power Plants," provides guidance for NRC licensees and applicants to use in developing and implementing practices that the staff finds acceptable for complying with the agency's regulatory requirements in Criterion 2, "Design Bases for Protection Against Natural Phenomena," as it appears in Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10, Part 50, of the Code of Federal Regulations (10 CFR Part 50). Specifically, Criterion 2 requires, in part, that nuclear power plant (NPP) structures, systems, and components (SSCs) that are important to safety must be designed to withstand the effects of natural phenomena without losing their capability to perform their respective safety functions.

While the regulations address lightning protection for safety-related electrical equipment, they do not explicitly provide guidance concerning the design and installation of lightning protection systems (LPSs) to ensure that electrical transients resulting from lightning phenomena do not cause spurious operation safety-related systems or render them inoperable. Toward that end, Regulatory Guide 1.204 augments the regulations by establishing explicit guidance that is consistent with LPS design and installation practices that are currently applied throughout the commercial power industry.

The scope of the guidance includes protection of (1) the power plant and relevant ancillary facilities, with the boundary beginning at the service entrance of buildings; (2) the plant switchyard; (3) the electrical distribution system, safety-related instrumentation and control (I&C) systems, communications, and personnel within the power plant; and (4) other important equipment in remote ancillary facilities that could impact safety. The scope includes signal lines, communication lines, and power lines, as well as testing and maintenance. The scope does not cover testing and design practices that are specifically intended to protect safety-related I&C systems against the secondary effects of lightning discharges [i.e., low-level power surges and electromagnetic and radio-frequency interference (EMI/RFI)]. These practices are covered in Regulatory Guide 1.180, "Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems." Regulatory Guide 1.180, which the NRC issued in January 2000 and revised in October 2003, addresses design, installation, and testing practices for dealing with the effects of EMI/RFI and power surges on safety-related I&C systems.

In Regulatory Guide. 1.204, the NRC staff has selected for endorsement a total of four standards issued by the Institute of Electrical and Electronics Engineers (IEEE), which taken together, provide comprehensive lightning protection guidance for nuclear power plants. Specifically, the four standards are IEEE Std. 665-1995 (reaffirmed 2001), IEEE Guide for Generating Station Grounding, IEEE Std. 666-1991 (reaffirmed 1996), IEEE Design Guide for Electrical Power Service Systems for Generating Stations, IEEE Std. 1050-1996, IEEE Guide for Instrumentation and Control Equipment Grounding in Generating Stations, and IEEE Std. C62.23-1995 (reaffirmed 2001), IEEE Application Guide for Surge Protection of Electric Generating Plants.

In February 2005, the NRC staff published a draft of this guide as Draft Regulatory Guide DG-1137. Following the closure of the public comment period on April 20, 2005, the staff resolved all stakeholder comments in the course of preparing the new Regulatory Guide 1.204.

The NRC staff encourages and welcomes comments and suggestions in connection with improvements to published regulatory guides, as well as items for inclusion in regulatory guides that are currently being developed. 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.

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 Regulatory Guide 1.204 may be directed to Christina E. Antonescu at (301) 415-6792 or via email to [CEA1@nrc.gov](mailto:CEA1@nrc.gov).

Regulatory guides are available for inspection or downloading through the NRC's public Web site in the Regulatory Guides document collection of the NRC's Electronic Reading Room at <http://www.nrc.gov/reading-rm/doc-collections>. Electronic copies of Regulatory Guide 1.204 are also available in the NRC's Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html>, under Accession No. ML052290422.

In addition, regulatory guides are 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](mailto: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](mailto:DISTRIBUTION@nrc.gov); or by fax to (301) 415-2289. Telephone requests cannot be accommodated.

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

Dated at Rockville, Maryland, this 30<sup>th</sup> day of November, 2005.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION,

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Office of Nuclear Regulatory Research