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Division 1
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DRAFT REGULATORY GUIDE AND VALUE/IMPACT STATEMENT

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SECOND PROPOSED REVISION 1 TO REGULATORY GUIDE 1.23

METEOROLOGICAL MEASUREMENT PROGRAM FOR NUCLEAR POWER PLANTS

A. INTRODUCTION

Paragraph 100.10(c)(2) of 10 CFR Part 100, "Reactor Site Criteria," states that, in determining the acceptability of a site for a power or test reactor, the Nuclear Regulatory Commission (NRC) will take into consideration meteorological conditions at the site and in the surrounding area.

Paragraph 50.36a(a)(2) of 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires nuclear power plant licensees to submit semiannual reports specifying the quantity of each of the principal radionuclides released to unrestricted areas in liquid and airborne effluents and such other information as may be required by the NRC to estimate maximum potential annual radiation doses to the public. A knowledge of meteorological conditions in the vicinity of the reactor is important in providing a basis for estimating annual radiation doses resulting from radioactive materials released in airborne effluents.

In order for the NRC to fulfill its responsibilities under the National Environmental Policy Act (NEPA) of 1969 and in accordance with the requirements of 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions"; Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation To Meet the Criterion 'As Low As Is Reasonably Achievable' for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents," to 10 CFR Part 50; and 10 CFR Part 20, "Standards for Protection Against Radiation," basic meteorological information

This regulatory guide and the associated value/impact statement are being issued in draft form to involve the public in the early stages of the development of a regulatory position in this area. They have not received complete staff review and do not represent an official NRC staff position.

Public comments are being solicited on both drafts, the guide (including any implementation schedule) and the value/impact statement. Comments on the value/impact statement should be accompanied by supporting data. Written comments may be submitted to the Rules and Procedures Branch, DRR, ADM, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Comments may also be delivered to Room 4000, Maryland National Bank Building, 7735 Old Georgetown Road, Bethesda, Maryland from 8:15 a.m. to 5:00 p.m. Copies of comments received may be examined at the NRC Public Document Room, 1717 H Street NW., Washington, DC. Comments will be most helpful if received by June 23, 1986.

Requests for single copies of draft 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. Attention: Director, Division of Technical Information and Document Control.

is necessary to assess environmental effects of a radiological and nonradiological nature resulting from the construction or operation of a nuclear power plant.

In addition to the requirements for determining meteorological conditions at nuclear power plants in order to assess siting, licensing, and environmental factors, detailed meteorological information is necessary for dealing with radiological emergencies. Section 50.47 of 10 CFR Part 50 and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50 require power plant licensees to provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. In this regard, it is necessary for the licensee to establish and maintain a meteorological program capable of rapidly providing meteorological information to assess and monitor actual or potential consequences of a radiological emergency condition.

Thus, at each nuclear power plant site there are multiple needs for programs that will adequately measure and document basic meteorological data. These data can be used to develop atmospheric diffusion parameters that, with an appropriate dispersion model, can be used to estimate potential radiation doses to the public resulting from routine or accidental releases for radioactive materials to the atmosphere or to evaluate the potential dose to the public as a result of hypothetical reactor accidents. This regulatory guide describes a meteorological measurement program acceptable to the NRC staff for providing meteorological data needed to estimate such radiation doses and to assess potential environmental effects of a nonradiological nature. This regulatory guide does not set forth new staff positions, but rather consolidates existing guidance on meteorological measurements contained in Regulatory Guides 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants To Assess Plant and Environs Conditions During and Following an Accident," and 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," and Supplement 1 to NUREG-0737 and clarifies the guidance contained in the previous version of this guide.

Any information collection activities mentioned in this draft regulatory guide are contained as requirements in 10 CFR Parts 50, 51, and 20. The information collection requirements in 10 CFR Parts 50, 51, and 20 have been cleared under OMB Clearance Nos. 3150-0011, 3150-0021, and 3150-0014.

B. DISCUSSION

The meteorological measurement program at a nuclear power plant site should be capable of providing the meteorological information required to make the following assessments:

1. A conservative assessment by the applicant or licensee and the NRC staff of the radiological consequences of airborne releases from design basis accidents. This will aid in evaluating the acceptability of a site and the adequacy of engineered safety features for a nuclear power plant in accordance with the requirements of 10 CFR Part 100.

2. A realistic assessment by the applicant or licensee and the NRC staff of the potential radiation dose to the public resulting from the routine release of radioactive materials in airborne effluents. These assessments assist in demonstrating that operations will be or are being conducted within the limits of 10 CFR Part 20 and in ensuring that effluent control equipment design objectives and proposed operating procedures meet the requirements of Appendix I to 10 CFR Part 50.

3. A realistic assessment by the applicant or licensee and other appropriate persons of the potential radiological consequences of an actual or projected accidental release of radioactive materials to the atmosphere in accordance with the requirements of Appendix E to 10 CFR Part 50.

4. A realistic assessment by the applicant or licensee and the NRC staff of the potential dispersion of radioactive materials from and the radiological consequences of a spectrum of accidents to aid in evaluating the environmental risk posed by a nuclear power plant in accordance with 10 CFR Part 51.

5. A realistic assessment by the applicant or licensee and the NRC staff of potential nonradiological environmental effects such as fogging, icing, and salt drift from cooling towers. This will aid in evaluating the environmental impact of a nuclear power plant in accordance with 10 CFR Part 51.

Guidance concerning the dispersion models to be used for evaluating the potential radiological consequences of design basis reactor accidents is given in Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants." Guidance concerning the dispersion models to be used for evaluating the potential effects of routine releases of radioactive effluents into the atmosphere is given in Regulatory

Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors." Guidance concerning the characteristics of atmospheric dispersion models to be used for evaluating the actual or projected offsite consequences of a radiological emergency condition is given in Regulatory Guide 1.101.

Guidance concerning the assessment of cooling system impacts is given in Section 5.3.3.1 of NUREG-0555, "Environmental Standard Review Plans for the Environmental Review of Construction Permit Applications for Nuclear Power Plants."

The principal purpose of this second proposed Revision 1* to this regulatory guide is to consolidate into a single document, simply for the sake of convenience, regulatory guidance equivalent to existing approved regulatory guidance applicable in all the contexts noted above. Endorsement of ANSI/ANS-2.5-1984, "Standard for Determining Meteorological Information at Nuclear Power Sites," by this guide is intended to accomplish such consolidation and nothing more. In that regard, it must be recognized that the ANSI/ANS-2.5-1984 standard being endorsed contains a significant amount of information that is tutorial in nature to an extent that is not normally included in a regulatory guide. Also, several portions of ANSI/ANS-2.5-1984 (e.g., definitions of terms, discussions of turbulence-typing schemes, methodology to minimize the influence of obstructions on meteorological measurements, methodology pertaining to time averaging/error estimation/data compilation, and ways to ensure adequate data recoverability) contain what appears to be intended by the framers of the standard as guidance to be applied by users (not simply treated as tutorial or informational), which goes beyond existing approved NRC regulatory guidance in the areas indicated. Where either of the above is the case, the content of ANSI/ANS-2.5-1984 is endorsed for implementation as a staff position only to that extent that does not go beyond applicable existing approved NRC guidance, as applied by the staff at the time of issuance of this guide in the licensing contexts specifically delineated in Section D, "Implementation."

C. REGULATORY POSITION

The requirements of ANSI/ANS-2.5-1984,** "Standard for Determining Meteorological Information at Nuclear Power Sites," are acceptable to the NRC staff

*An earlier version, the first proposed Revision 1, was issued for public comment in September 1980.

**Copies may be obtained from the American Nuclear Society, 555 North Kensington Avenue, La Grange Park, Illinois 60525.

in providing guidance for satisfying the Commission's regulations pertaining to the meteorological measurement program needed to provide meteorological data to be used in the evaluation of the environmental impact and the impacts of the routine radioactivity release and the accidental radioactivity release that may be associated with the construction and operation of nuclear power plants. Although ANSI/ASME NQA-1-1983, "Quality Assurance Program Requirements for Nuclear Facilities," is referenced in ANSI/ANS-2.5-1984, it is not endorsed in this regulatory guide for use with quality assurance programs related to meteorological measurement programs for operating nuclear power plants. It does, however, contain helpful information that, if used, should be applied in a manner consistent with current regulatory practice including, but not limited to, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50. Further, quality assurance records need not be retained for the lifetime of the facility. Guidance concerning quality assurance program recommendations and record retention related to meteorological measurement programs for operating nuclear power plants may be found in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)."

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC staff's plans for using this regulatory guide. This proposed revision to the regulatory guide has been published to encourage public participation in its development.

Except in those cases in which an applicant or licensee proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method to be described in the final guide reflecting public comments will be used in the evaluation of:

1. Construction permit applications that are docketed after or are in review at the date of issuance of the final guide;
2. Operating license applications that are docketed after or are in review at the date of issuance of the final guide;
3. Amendment applications or other submittals by licensees of operating nuclear power plants that are docketed after or are in review at the date of issuance of the final guide, but only to the extent that legal requirements and

previous written commitments by the licensee are not exceeded when reviewers apply the guidance presented in the regulatory position of this guide.

It is specifically noted that the principal purpose in issuing this regulatory guide is to consolidate existing approved guidance. When applied in any of the contexts delineated above, its provisions may not be used to impose any staff positions beyond those already approved and applicable at the date of issuance of the final guide. The guidance may not be used to require any actions of licensees or applicants that go beyond legal requirements and their written commitments that have been previously accepted by the staff as an adequate basis for issuing their licenses or permits.

DRAFT VALUE/IMPACT STATEMENT

1. PROPOSED ACTION

1.1 Description

The proposed action consists of issuing a revised regulatory guide that will not set forth new staff positions. Rather, the revised regulatory guide will:

1. Clarify the recommendations of Regulatory Guide 1.23 (Safety Guide 23), "Onsite Meteorological Programs," which provides guidance for establishing and operating meteorological measurement programs at nuclear power plant sites; and

2. Consolidate guidance on meteorological measurements for emergency response purposes contained in Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants To Assess Plant and Environs Conditions During and Following an Accident," Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," and Supplement 1, "Requirements for Emergency Response Capability," to NUREG-0737, "Clarification of the TMI Action Plan Requirements."

Meteorological programs are necessary to measure and collect meteorological information that is used in estimating potential radiation doses to the public resulting from actual routine releases of radioactive materials into the atmosphere and to estimate either potential doses to the public as a result of a hypothetical reactor accident or actual doses in the case of a real accident.

1.2 Need for Proposed Action

Regulatory Guide 1.23 was originally issued as Safety Guide 23 in February 1972. Much of the information provided in the guide is now obsolete, having been made so by changes in the state of the art in meteorological measurement

technology and by changes discussed in the guide in the meteorological evaluation procedures in which the meteorological data are to be used. A revision of this guide is deemed necessary to strengthen the guidance in an area shown to be weak as a result of the Three Mile Island experience, to update other areas that are obsolete, and to eliminate areas that are of little or no value to users.

1.3 Value/Impact of Proposed Action

1.3.1 NRC

The NRC will benefit by the reduction in time needed to work on submittals related to meteorological programs because of improved guidance on how to meet the NRC requirements, thereby freeing its resources for other substantive safety issues. Furthermore, inquiries related to current practice will be minimized.

The meteorological capabilities required to implement current emergency plans for operating nuclear power plants and operating license applications include a measurement program to represent the plant vicinity and area described as the plume exposure Emergency Planning Zone. The integration of this function with the various planning standards of Appendix E to 10 CFR Part 50 has been outlined in Regulatory Guides 1.97 and 1.101 and in NUREG-0696, "Functional Criteria for Emergency Response Facilities," and Supplement 1 to NUREG-0737. The revised guide will provide detailed guidance on these measurement programs and will be used as a basis for the staff evaluation of the adequacy of emergency plans. This revised guide will continue to be used as a basis for other licensing actions.

1.3.2 Other Government Agencies

Applicant agencies (e.g., TVA) would be affected as discussed in Section 1.3.3. Upon completion of the proposed action, other agencies will have a current, complete reference document describing the NRC's recommendations concerning meteorological measurement programs at nuclear power plant sites.

1.3.3 Industry

Industry will benefit by having available a current, complete source of information concerning NRC recommendations for establishing and operating the meteorological measurement programs at nuclear power plant sites. This will

result in the reduction in time needed to work on submittals related to meteorological programs because of improved guidance on how to meet the NRC requirements, thereby freeing industry resources for other substantive safety issues. Since the product document endorses an ANS standard, in part, the nuclear industry has considered the recommendations to be acceptable. Guidance concerning the part of the standard that is not endorsed by the proposed revised guide is provided by reference to other active regulatory guidance. Hence, there is no additional impact on industry.

1.3.4 Public

The public will benefit by an increased assurance that meteorological information representative of the site, which might prove crucial in an emergency situation, will be available. The public will also benefit from the availability of a current reference document that presents the complete NRC recommendations concerning meteorological measurement programs at nuclear power plant sites.

1.4 Decision on Proposed Action

The proposed action should be accomplished on a priority basis.

2. TECHNICAL APPROACH

This section is not applicable to this value/impact statement since the proposed action is an update of previously issued guidance.

3. PROCEDURAL APPROACH

Since the proposed action is an update of information contained in an existing regulatory guide, the appropriate procedural approach is a revision of the existing guide.

4. STATUTORY CONSIDERATIONS

4.1 NRC Authority

Authority for this guide would be derived from the safety requirements of the Atomic Energy Act through the Commission's regulations. In particular, paragraph 100.10(c)(2) of 10 CFR Part 100 states that, in determining the acceptability of a site for a power or test reactor, the Commission will take into consideration meteorological conditions at the site and in the surrounding area. Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50 requires that applicants for an operating license develop plans for coping with radiological emergencies. The plans must include criteria for determining when protective measures should be considered within and outside the site boundary to protect health, safety, and property. In this regard, it is necessary for the applicant to establish and maintain a meteorological program capable of rapidly assessing critical meteorological parameters. Section 50.47 of 10 CFR Part 50 requires nuclear power plant licensees to provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. In developing the onsite and offsite emergency response plans, licensees should provide that "adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use." Further, paragraph 50.36a(a)(2) of 10 CFR Part 50 requires nuclear power plant licensees to submit semiannual reports specifying the quantity of each of the principal radionuclides released to unrestricted areas in gaseous effluents and such other information as may be required by the Commission to estimate maximum potential doses to the public resulting from these releases to ensure compliance with the requirements of 10 CFR Part 20. A knowledge of meteorological conditions in the vicinity of the plant is necessary to make these estimates. Finally, in order for the Commission to fulfill its responsibilities under NEPA and in accordance with the requirements of Appendix I to 10 CFR Part 50 and of 10 CFR Part 51, meteorological information must be available for use in assessing potentially adverse environmental effects resulting from the construction or operation of a nuclear power plant.

4.2 Need for NEPA Assessment

Issuance or amendment of guides for the implementation of regulations in Title 10, Chapter I, of the Code of Federal Regulations is a categorical exclusion under paragraph 51.22(c)(16) of 10 CFR Part 51. Thus, an environmental impact statement or assessment is not required for this action.

5. RELATIONSHIP TO OTHER EXISTING OR PROPOSED REGULATIONS OR POLICIES

No potential conflicts with other agencies have been identified. The product document will be used in the implementation of 10 CFR Part 20, 10 CFR Part 50, 10 CFR Part 51, and 10 CFR Part 100 as described above. The product document will supersede Regulatory Guide 1.23, "Onsite Meteorological Programs." The guidance in the proposed revised guide will be consistent with that in:

Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)";

Regulatory Guide 4.2, "Preparation of Environmental Reports for Nuclear Power Stations";

Regulatory Guide 1.3, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss-of-Coolant Accident for Boiling Water Reactors";

Regulatory Guide 1.4, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss-of-Coolant Accident for Pressurized Water Reactors";

Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants";

Regulatory Guide 1.28, "Quality Assurance Program Requirements (Design and Construction)";

Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)";

Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants To Assess Plant and Environs Conditions During and Following an Accident";

Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors";

Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors"; and

Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants."

The guidance in the proposed revised guide will also be consistent with Revision 1 to NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," NUREG-0696, "Functional Criteria for Emergency Response Facilities," and Supplement 1, "Requirements for Emergency Response Capability," to NUREG-0737, "Clarification of the TMI Action Plan Requirements."

Regulatory Guide 3.8, "Preparation of Environmental Reports for Uranium Mills," references the meteorological measurement program and data format presented in Regulatory Guide 1.23. Since the revised meteorological measurement program described in the proposed revision to Regulatory Guide 1.23 may not be appropriate for most uranium mills, a recommendation to make changes in Regulatory Guide 3.8 was made during the comment resolution process. Guidance concerning meteorological measurement programs is being developed for uranium recovery facilities.

6. SUMMARY AND CONCLUSIONS

A revision to Regulatory Guide 1.23, "Onsite Meteorological Programs," that endorses ANSI/ANS-2.5-1984, "Standard for Determining Meteorological Information at Nuclear Power Sites," should be issued.