U.S. NUCLEAR REGULATORY COMMISSION

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REGULATORY GUIDE

OFFICE OF STANDARDS DEVELOPMENT

REGULATORY GUIDE 1.94

QUALITY ASSURANCE REQUIREMENTS FOR INSTALLATION, INSPECTION, AND TESTING OF STRUCTURAL CONCRETE AND STRUCTURAL STEEL DURING THE CONSTRUCTION PHASE OF NUCLEAR POWER PLANTS

A. INTRODUCTION

Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Licensing of Production and Utilization Facilities," establishes overall quality assurance requirements for the design, construction, and operation of safety-related structures, systems, and components of nuclear power plants. This guide describes a method acceptable to the NRC staff for complying with the Commission's regulations with regard to quality assurance requirements for installation, inspection, and testing of structural concrete and structural steel during the construction phase of nuclear power plants. This guide applies to all types of nuclear power plants.

B. DISCUSSION

Working Group N45.2.5 of the American National Standards Committee N45, Reactor Plants and Their Maintenance, has prepared a standard that includes quality assurance requirements for installation, inspection, and testing of structural concrete and structural steel during the construction phase of nuclear power plants. This standard was approved by Subcommittee N45-2, Nuclear Quality Assurance Standards, of the American National Standards Committee N45, and the full committee. It was subsequently approved and designated N45.2.5-1974[1] by the American National Standards Institute on July 8, 1974.

[1]ANSI N45.2.5-1974, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants." Copies may be obtained from the American Society of Mechanical Engineers, 345 East 47th Street, New York, New York 10017.

C. REGULATORY POSITION

The requirements and guidelines that are included in ANSI N45.2.5-1974 for installation, inspection, and testing of structural concrete and structural steel during the construction phase of nuclear power plants are generally acceptable to the NRC staff and provide an adequate basis for complying with the pertinent quality assurance requirements of Appendix B to 10 CFR Part 50, subject to the following:

1. Subdivision 1.5 of ANSI N45.2.5-1974 states: "Other documents that are required to be included as a part of this standard are identified at the point of reference and listed in Section 8 and the Appendix of this Standard." The specific applicability or acceptability of documents listed in Section 8 has been covered separately in other regulatory guides. Other standards and codes listed in ANSI N45.2.5-1974 provide useful guidance for the installation, inspection, and testing of structural concrete and structural steel. Prior to use of these other referenced codes and standards, however, the suitability of the standard or code should be reviewed for the particular application under consideration.

2. Subdivision 2.1 of ANSI N45.2.5-1974 includes general provisions for planning the installation, inspection, and testing of structural concrete and structural steel. In this regard the provisions of Subdivision 2.1 of ANSI N45.2.5-1974 should be used in conjunction with Regulatory Guide 1.55, "Concrete Placement in Category I Structures."

3. Subdivision 4.5 of ANSI N45.2.5-1974 provides, in part, that inspection of concrete placement shall be performed to verify the adequacy of concrete consolidation equipment and technique of operation. ACI 309-72,

USNRC REGULATORY GUIDES

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Comments and suggestions for improvements in these guides are encouraged at all times, and guides will be revised, as appropriate, to accommodate comments and to reflect new information or experience. However, comments on this guide, if received within about two months after its issuance, will be particularly useful in evaluating the need for an early revision.

Comments should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Section.

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Copies of published guides may be obtained by written request indicating the divisions desired to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Office of Standards Development.

"Recommended Practice for Consolidation of Concrete," should be used as a basis for determining the adequacy of the equipment for concrete consolidation and of the technique of operation.

4. Subdivision 4.10 of ANSI N45.2.5-1974 states: "Welded reinforcing bar splices shall be subject to the requirements of Section 5.5, except that provisions of AWS D 12.1 shall apply." The provisions of Articles CC-4334 and CC-4330 of the "Proposed Standard Code for Concrete Reactor Vessels and Containments" (Proposed ASME Boiler and Pressure Code Section III, Division 2, through Committee Addenda 6)[2] for testing of welded reinforcing bar splices should be used as interim guidance pending issuance of ASME Section III Division 2 as an approved Code and appropriate endorsement by the NRC staff.

[2]Copies may be obtained from The American Concrete Institute, P.O. Box 4754, Detroit, Michigan 48219.

D. IMPLEMENTATION

The purpose of this section is to provide guidance to applicants and licensees regarding the NRC staff's plans for utilizing this regulatory guide.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used in the evaluation of construction permit submittals for applications docketed after May 1, 1975. If an applicant whose application for a construction permit is docketed on or before May 1, 1975 wishes to use this regulatory guide in developing submittals for applications, the pertinent portions of the application will be evaluated on the basis of this guide.

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