



U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF STANDARDS DEVELOPMENT
DRAFT REGULATORY GUIDE AND VALUE/IMPACT STATEMENT

September 1979
Division 1
Task RS 908-5

PROPOSED REVISION 2* TO REGULATORY GUIDE 1.94

QUALITY ASSURANCE REQUIREMENTS
FOR INSTALLATION, INSPECTION, AND TESTING OF STRUCTURAL CONCRETE,
STRUCTURAL STEEL, SOILS, AND FOUNDATIONS 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, "Domestic 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, structural steel, soils, and foundations during the construction phase of nuclear power plants. This guide applies to all types of nuclear power plants.

B. DISCUSSION

The American Society of Mechanical Engineers Committee on Nuclear Quality Assurance has prepared a standard that includes quality assurance requirements for installation, inspection, and testing of structural concrete, structural steel, soils, and foundations during the construction phase of nuclear power plants. This standard was prepared as a revision to ANSI N45.2.5-1974 and was

* The substantial number of changes in this proposed revision has made it impractical to indicate the changes with lines in the margin.

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, have not been reviewed by the NRC Regulatory Requirements Review Committee, 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. Comments on both drafts should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch, by NOV 23 1979

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, D.C. 20555, Attention: Director, Division of Technical Information and Document Control.

subsequently approved and designated ANSI/ASME N45.2.5-1978¹ by the American National Standards Institute on March 8, 1978.

C. REGULATORY POSITION

The requirements and guidelines that are included in ANSI/ASME N45.2.5-1978 for installation, inspection, and testing of structural concrete, structural steel, soils, and foundations not covered by Section III, Division 2 of the ASME Boiler and Pressure Vessel Code² are 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. Section 1.4, "Definitions," of ANSI/ASME N45.2.5-1978, in the definition of the term "Delivery Point" states that "...the delivery point and the mixing point are considered coincident when: (1) the delivery point is not more than a distance of two miles and an average of one-half hour in transit from the mixing point, and (2) the delivered concrete commences to be placed within an average of one-half hour from the time the transporting vehicle arrives at the delivery point." The one-half hour should be considered the maximum allowable time for determining delivery and mixing point coincidence.

2. Subsection 2.5.2, "Calibration and Control," of ANSI/ASME N45.2.5-1978 discusses calibration and control of measuring and test equipment. Reference standards used for calibrating measuring and test equipment should have an accuracy level, acceptable calibration ranges, and precisions that are equal to or better than those required of measuring and test equipment. The accuracies of the measuring and test equipment and the reference standards should be chosen so that the equipment being calibrated and maintained is within the required tolerances.

¹ANSI/ASME N45.2.5-1978, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete, Structural Steel, Soils and Foundations During the Construction Phase of Nuclear Power Plants." Copies may be obtained from the American Society of Mechanical Engineers (ASME), 345 East 47th Street, New York, New York 10017.

²Copies may be obtained from the ASME (see footnote 1).

3. Section 6.4, "Preplacement Preparations," of ANSI/ASME N45.2.5-1978 discusses inspections of preparations for concrete placement. In conjunction with Section 6.4 of the standard, structures that perform a shielding function should be inspected for embedments in accordance with Section 7, "Embedments," of ANSI N101.6-1977, "Concrete Radiation Shields."³

4. Subsection 6.12.1, "Qualification of Operators," of the standard discusses requalification of crew personnel who splice reinforcing bars and states, "The requalification procedure should be identical to the initial qualification procedure." This guidance has sufficient safety importance to be treated the same as other requirements in the standard (indicated by the verb "shall").

5. Subsection 7.4.2, "Inspection Tools and Procedures," of ANSI/ASME N45.2.5-1978 states that "Hand torque wrenches...must be calibrated at least weekly and...Impact torque wrenches...must be calibrated at least twice daily." Also, Subsection 8.4, "Soils Test Data Evaluation and Analysis," states that "When statistical methods are required by the specification, the desired level of confidence must be specified." For consistency with other requirements of the standard, each "must" should be treated as a "shall."

6. Section 10, "Revision of American National Standards Referred to in this Document," of ANSI/ASME N45.2.5-1978 discusses a number of American National Standards Institute standards that are referenced in ANSI/ASME N45.2.5-1978. The applicability of these listed documents is covered separately in the following regulatory guides.

<u>Regulatory Guide</u>	<u>ANSI Standard</u>
1.28	N45.2
1.38	N45.2.2
1.39	N45.2.3
1.58	N45.2.6
1.88	N45.2.9
1.74	N45.2.10

³Copies may be obtained from the American Nuclear Society, 555 North Kensington Avenue, La Grange Park, Illinois 60525.

D. IMPLEMENTATION

This proposed guide has been released to encourage public participation in its development. Except in those cases in which an applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method to be described in the active guide reflecting public comments will be used in the evaluation of all (1) construction permit applications, (2) standard reference system preliminary design applications (PDA) or Type-2 final design applications (FDA-2), and (3) licenses to manufacture after the implementation date to be specified in the active guide, except those portions of a construction permit application that:

a. Reference an approved standard reference system preliminary or final design (PDA or FDA) or an application for approval of such design.

b. Reference an approved standard duplicate plant preliminary or final design (PDDA or FDDA).

c. Reference parts of a base plant design qualified and approved for replication.

d. Reference a plant design approved or under review for approval for manufacture under a Manufacturing License.

This implementation date (to be specified in the active guide) will in no case be earlier than May 1980.

DRAFT VALUE/IMPACT STATEMENT

1. THE PROPOSED ACTION

1.1 Description

The applicant for a permit to construct a nuclear power plant is required by the Commission's regulations to establish and implement a quality assurance program. The proposed action will provide updated guidance on quality assurance program requirements for structural concrete, structural steel, soils, and foundations for nuclear power plants.

1.2 Need for the Proposed Action

Existing guidance on quality assurance requirements for structural concrete and structural steel is contained in Revision 1 to 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," dated April 1976, and Regulatory Guide 1.55, "Concrete Placement in Category I Structures," dated June 1973. Regulatory Guide 1.94, Revision 1, endorses ANSI/ASME Standard N45.2.5-1974. Regulatory Guide 1.55 contains general requirements concerning quality assurance for concrete placement. Regulatory Guide 1.94 contains more specific guidance for concrete placement.

Revision 1 to ANSI/ASME N45.2.5-1974 has been approved by ANSI and designated ANSI/ASME N45.2.5-1978. The revision provides more detailed guidance reflecting additional experience with quality assurance requirements for structural steel and structural concrete and includes requirements for soils, earthwork, and foundation inspection. Current NRC guidance should be updated to reflect experience in the use of the guidance and to establish an NRC position on the approved national standard. Consistent with past NRC practice, promulgation of this guidance should be in the form of a regulatory guide endorsing the revised national standard.

1.3 Value/Impact of the Proposed Action

1.3.1 NRC Operations

The NRC staff has been involved in the development, review, and approval of the revised national standard. The proposed action will establish an NRC position by taking advantage of previous staff effort in conjunction with approval of the revised national standard and therefore will have minimal impact. Additionally, upon completion of the proposed action, Regulatory Guide 1.55 can be withdrawn thus eliminating the maintenance effort associated with Regulatory Guide 1.55.

1.3.2 Other Government Agencies

Not applicable, unless the government agency is an applicant, such as TVA.

1.3.3 Industry

The proposed action establishes an NRC position to an existing national standard and therefore reduces uncertainty as to what the staff considers acceptable in the area of quality assurance requirements for structural concrete, structural steel, soils, and foundations during the construction phase of nuclear power plants. Most of the impact on industry has already been accomplished in conjunction with development, review, and approval of the national standard. Additional impact associated with NRC endorsement of the standard should be minimal.

1.3.4 Workers (relative to ALARA)

Not applicable.

1.3.5 Public

No impact on the public can be foreseen.

Regulatory Position 1 provides an NRC staff position concerning maximum allowable concrete delivery and placement times and has minimal impact. Additionally, the guidance in the regulatory position is more enforceable since confusion about how "average" times are computed has been eliminated.

Regulatory Position 2 clarifies guidance concerning the calibration of measuring and test equipment and has no impact.

Regulatory Position 3 provides additional guidance concerning inspections of concrete placement and has minimal impact.

Regulatory Position 4 clarifies guidance about requalification of personnel who splice reinforcing bars and has minimal impact.

Regulatory Position 5 describes an editorial change and has no impact.

Regulatory Position 6 provides information to the user of the guide concerning applicability of referenced standards and has no impact.

1.4. Decision on the Proposed Action

As previously stated, guidance should be issued on the revised quality assurance requirements for structural concrete, structural steel, soils, and foundations during the construction phase of nuclear power plants.

2. TECHNICAL APPROACH

This section is not applicable to this value/impact statement since the proposed action is an endorsement of a recently approved and issued national standard. The technical issues have been previously discussed.

3. PROCEDURAL APPROACH

Previously discussed.

4. STATUTORY CONSIDERATIONS

4.1 NRC Authority

Authority for this guide would be derived from the licensing authority and safety requirements of the Atomic Energy Act. In particular, Criterion II of Appendix B to 10 CFR Part 50 requires, in part, that an applicant (licensee) of a nuclear power plant establish a quality assurance program.

4.2 Need for NEPA Assessment

The proposed action is not a major action, as defined by 10 CFR Part 51.5(a)(10), and does not require an environmental impact statement.

5. RELATIONSHIP TO OTHER EXISTING OR PROPOSED REGULATIONS OR POLICIES

No conflicts or overlaps with requirements promulgated by other agencies are foreseen. Implementation of the proposed action is discussed in Section D of the proposed guide.

6. SUMMARY AND CONCLUSIONS

The proposed revision to Regulatory Guide 1.94 on supplementary quality assurance requirements for installation, inspection, and testing of structural concrete, structural steel, soils, and foundations during the construction phase of nuclear power plants should be issued.

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