U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REGULATORY RESEARCH

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Revision 2

REGULATORY GUIDE

REGULATORY GUIDE 2.3

(Draft was issued as DG-2005, dated March 2012)

QUALITY VERIFICATION FOR PLATE-TYPE URANIUM-ALUMINUM FUEL ELEMENTS FOR USE IN RESEARCH AND TEST REACTORS

A. INTRODUCTION

Purpose

This guide provides guidance that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for complying with the Commission's regulations on establishing and executing a quality assurance program for verifying the quality of plate-type uranium-aluminum fuel elements used in research and test reactors (RTRs).

Applicable Rules and Regulations

Title 10, Section 50.34(a) (7), of the *Code of Federal Regulations* (10 CFR Part 50) (Ref. 1), requires each applicant for a construction permit to build a production or utilization facility to describe in its preliminary safety analysis report the quality assurance program that will be applied to the design, fabrication, construction, and testing of the facility's structures, systems, and components. Title 10, Section 52.11, of the *Code of Federal Regulations* (10 CFR Part 52) (Ref. 2), requires information collection.

Related Guidance

Regulatory Guide 2.5, "Quality Assurance Program Requirements for Research and Test Reactors," (Ref. 3) contains methods that the NRC staff finds acceptable for complying with the Commission's regulations on the overall quality assurance program requirements for RTRs.

Purpose of Regulatory Guides

The NRC issues regulatory guides to describe to the public methods that the staff considers acceptable for use in implementing specific parts of the agency's regulations, to explain techniques that the staff uses in evaluating specific problems or postulated accidents, and to provide guidance to

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Electronic copies of this regulatory guide, previous versions of this guide, and other recently issued guides are available through the NRC's public Web site under the Regulatory Guides document collection of the NRC Library at http://www.nrc.gov/reading-rm/doc-collections/. The regulatory guide is also available through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html, under ADAMS Accession No. ML12160A492. The regulatory analysis may be found in ADAMS under Accession No. ML12160A494 and the staff responses to the public comments on DG-2005 may be found under ADAMS Accession No. ML12160A496.

applicants. Regulatory guides are not substitutes for regulations and compliance with them is not required. Methods and solutions that differ from those set forth in regulatory guides will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission.

Paperwork Reduction Act

This regulatory guide contains information collection requirements covered by 10 CFR Part 50 and 10 CFR Part 52 that the Office of Management and Budget (OMB) approved under OMB control number 3150-0011 and 3150-0151, respectively. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information collection request or requirement unless the requesting document displays a currently valid OMB control number.

B. DISCUSSION

Reason for Revision

Revision 1 to Regulatory Guide 2.3, issued in July 1976, endorsed the guidance provided in the American National Standards Institute (ANSI) N398-1974, "Quality Verification for Plate-Type Uranium-Aluminum Fuel Elements." It was subsequently approved and designated ANSI N398-1974 by ANSI on November 19, 1974 and covers only one limited aspect of quality assurance. ANSI N398-1974 has been superseded and is no longer supported by the NRC staff. Revision 2 to Regulatory Guide 2.3 refers to the guidance in ANSI/ANS-15.2-1999, "Quality Control for Plate-Type Uranium-Aluminum Fuel Elements" (Ref. 4).

Background

The NRC initially issued Regulatory Guide 2.3 in 1975 to provide guidance concerning procedures that the staff considered acceptable for complying with the agency's regulatory requirements in 10 CFR 50.34(a) (7). The original guide endorsed specific safety standards to provide guidelines for establishing and executing a program designed to verify the quality of plate-type uranium-aluminum fuel elements for use in research reactors. The American Nuclear Society (ANS) Subcommittee on the Operation of Research Reactors (ANS-15) rewrote ANSI N398-1974, issued it as ANSI/ANS-15.2-1999, and subsequently reaffirmed the standard in March 2009. The NRC staff believes that the foreword to ANSI/ANS-15.2-1999 (R2009) has several important assumptions about its use.

Harmonization with International Standards

The International Atomic Energy Agency (IAEA) has established a series of safety standards constituting a high level of safety for protecting people and the environment. Relative to this regulatory guide, IAEA Safety Requirements publication NS-R-4, "Safety at Research Reactors" (Ref. 5), provides quality assurance requirements in sections 4.5-4.13, as part of an overall system of management and verification controls. While the NRC has an interest in facilitating the harmonization of standards used domestically and internationally, the NRC does not specifically endorse NS-R-4, and is only acknowledging that it may be useful as a reference for general information. The NRC could consider the use of the international standard in a licensing action following adequate justification and technical review.

Documents Discussed in Staff Regulatory Guidance

This regulatory guide endorses the use of one or more codes or standards developed by external organizations, and other third party guidance documents. These codes, standards and third party guidance documents may contain references to other codes, standards or third party guidance documents ("secondary references"). If a secondary reference has itself been incorporated by reference into NRC regulations as a requirement, then licensees and applicants must comply with that standard as set forth in the regulation. If the secondary reference has been endorsed in a regulatory guide as an acceptable approach for meeting an NRC requirement, then the standard constitutes a method acceptable to the NRC staff for meeting that regulatory requirement as described in the specific regulatory guide. If the secondary reference has neither been incorporated by reference into NRC regulations nor endorsed in a regulatory guide, then the secondary reference is neither a legally-binding requirement nor a "generic" NRC approval as an acceptable approach for meeting an NRC requirement. However, licensees and applicants may consider and use the information in the secondary reference, if appropriately justified and consistent with current regulatory practice, consistent with applicable NRC requirements such as 10 CFR 50.59.

C. STAFF REGULATORY GUIDANCE

The NRC staff finds ANSI/ANS-15.2-1999 (R2009), "Quality Control for Plate-Type Uranium-Aluminum Fuel Elements," provides an acceptable method for complying with the requirements in 10 CFR 50.34(a)(7) in regard to establishing and executing a quality assurance program for verifying the quality of plate-type uranium-aluminum fuel elements for use in RTRs, subject to the following condition:

(1) ANSI/ANS-15.2-1999 (R2009), Section 13.4, "Verification of Fuel Element Assembly Dimensions," requires a verification of items 1–6, with item 6 designated "functional fit." The NRC staff considers item 6 a desired test, but not required.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC's plans for using this regulatory guide. The regulatory position held in this guidance demonstrates the method that the NRC staff finds acceptable for an applicant or licensee to meet the requirements of the underlying NRC regulations. Methods or solutions that differ from those described in this regulatory guide may be deemed acceptable if they provide sufficient basis and information for the NRC staff to verify that the proposed alternative demonstrates compliance with the appropriate NRC regulations. Current licensees may continue to use guidance the NRC found acceptable for complying with the identified regulations as long as their current licensing basis remains unchanged**.**

The imposition of the guidance in this regulatory guide is not a backfit, as that term is defined in 10 CFR 50.109, "Backfitting," because non-power reactor licensees are not included within the scope of entities protected by the Backfit Rule.

REFERENCES[1]

1. 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," U.S. Nuclear Regulatory Commission, Washington, DC.

2. 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," U.S. Nuclear Regulatory Commission, Washington, DC.

3. Regulatory Guide 2.5, "Quality Assurance Program Requirements for Research and Test Reactors," U.S. Nuclear Regulatory Commission, Washington, DC.

4. ANSI/ANS-15.2-1999 (R2009), "Quality Control for Plate-Type Uranium-Aluminum Fuel Elements," American Nuclear Society, La Grange Park, IL.[2]

5. Safety Requirements, NS-R-4, "Safety at Research Reactors," September, 2005, International Atomic Energy Agency, Vienna, Austria.[3]

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[1] Publicly available NRC published documents are available electronically through the NRC Library on the NRC's public Web site at: http://www.nrc.gov/reading-rm/doc-collections/. The documents can also be viewed on-line or printed for a fee in the NRC's Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD; the mailing address is USNRC PDR, Washington, DC 20555; telephone 301-415-4737 or (800) 397-4209; fax (301) 415-3548; and e-mail pdr.resource@nrc.gov.

[2] Copies of American Nuclear Society (ANS) standards may be purchased from the ANS Web site (http://www.new.ans.org/store/) ; or by writing to: American Nuclear Society, 555 North Kensington Avenue, La Grange Park, Illinois 60526, U.S.A., Telephone 800-323-3044.

[3] Copies of International Atomic Energy Agency (IAEA) documents may be obtained through their Web site: WWW.IAEA.Org/ or by writing the International Atomic Energy Agency P.O. Box 100 Wagramer Strasse 5, A-1400 Vienna, Austria. Telephone (+431) 2600-0, Fax (+431) 2600-7, or E-Mail at Official.Mail@IAEA.Org