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

July 2009
Division 1

DRAFT REGULATORY GUIDE

Contact: N. Gilles
(301) 415-1180

DRAFT REGULATORY GUIDE DG-1176

(New Regulatory Guide)

GUIDANCE FOR THE ASSESSMENT OF BEYOND-DESIGN-BASIS AIRCRAFT IMPACTS

A. INTRODUCTION

This guide describes a method that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for use in satisfying its regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," regarding the consideration of aircraft impacts for new nuclear power reactors (Ref. 1). In particular, this guide endorses the methodologies described in the industry guidance document, Nuclear Energy Institute (NEI) 07-13, "Methodology for Performing Aircraft Impact Assessments for New Plant Designs," Revision 7, issued May 2009 (Ref. 2). The public version of NEI 07-13 can be found in the NRC's Agencywide Documents Access and Management System (ADAMS), Accession No. ML091490723. Publicly available documents created or received at the NRC are available electronically at the NRC's Electronic Reading Room at http://www.nrc.gov/reading-rm/adams.html. From this page, the public can enter the ADAMS database, which provides text and image files of the NRC's public documents. Persons who do not have access to ADAMS, or who have problems accessing the documents located in ADAMS, may contact the reference staff in the NRC's Public Document Room at 1-899-397-4209 or 301-415-4737, or by e-mail at pdr.resource@nrc.gov. Nonpublic versions of this regulatory guide and NEI 07-13 contain more specific details about the methodology for performing aircraft impact assessments and will be handled under Safeguards Information (SGI) controls. Because the nonpublic guidance documents will contain SGI, the documents will only be made available to those individuals with a need to know and who are otherwise qualified to have access to SGI. Plant designers (including their employees and agents) who meet the NRC's requirements for access to SGI will be entitled to use the more detailed guidance documents to perform the aircraft impact assessments.

This regulatory guide is being issued in draft form to involve the public in the early stages of the development of a regulatory position in this area. It has not received final staff review or approval and does not represent an official NRC final staff position.

Public comments are being solicited on this draft guide (including any implementation schedule) and its associated regulatory analysis or value/impact statement. Comments should be accompanied by appropriate supporting data. Written comments may be submitted to the Rulemaking and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; submitted through the NRC's interactive rulemaking Web page at http://www.nrc.gov; or faxed to (301) 492-3446. Copies of comments received may be examined at the NRC's Public Document Room, 11555 Rockville Pike, Rockville, MD. Comments will be most helpful if received by September 8, 2009.

Electronic copies of this draft regulatory guide are available through the NRC's interactive rulemaking Web page (see above); the NRC's public Web site under Draft Regulatory Guides in the Regulatory Guides document collection of the NRC's Electronic Reading Room at http://www.nrc.gov/reading-rm/doc-collections/; and the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html, under Accession No. ML073170252.

The NRC issues regulatory guides (RGs) 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 applicants. RGs are not substitutes for regulations and compliance with them is not required.

This RG contains information collection requirements covered by 10 CFR Part 50 that the Office of Management and Budget (OMB) approved under OMB control number 3150-0011. 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

Background

In 2009, the NRC amended its regulations to require applicants for new nuclear power reactors to perform a design-specific assessment of the effects of the impact of a large, commercial aircraft (Volume 74 of the *Federal Register*, page 28111 (74 FR 28111); June 12, 2009) (Ref. 3). The requirements affected or adopted by this rulemaking include 10 CFR 50.8, "Information Collection Requirements: OMB Approval"; 10 CFR 50.34, "Contents of Applications: Technical Information"; 10 CFR 50.150, "Aircraft Impact Assessment"; 10 CFR 52.47, "Contents of Applications: Technical Information" (Ref. 4); 10 CFR 52.59, "Criteria for Renewal"; 10 CFR 52.79, "Contents of Applications: Technical Information in Final Safety Analysis Report"; 10 CFR 52.137, "Contents of Applications: Technical Information"; and 10 CFR 52.157, "Contents of Applications: Technical Information in Final Safety Analysis Report."

The NRC believes that it is prudent for nuclear power plant designers to take into account the potential effects of the impact of a large, commercial aircraft. The NRC has determined that the impact of a large, commercial aircraft is a beyond-design-basis event, and the NRC's requirements that apply to the design, construction, testing, operation, and maintenance of design features and functional capabilities for design-basis events will not apply to design features or functional capabilities selected by the applicant solely to meet the requirements of the aircraft impact rule. The NRC's approach to aircraft impacts is consistent with its previous approach to beyond-design-basis events. The objective of this rule is to require nuclear power plant designers to rigorously assess the design to identify design features and functional capabilities that could provide additional inherent protection to withstand the effects of an aircraft impact. The NRC expects the rule to result in new nuclear power reactor facilities that are inherently more robust, with regard to an aircraft impact, than if they were designed in the absence of the aircraft impact rule. The rule provides an enhanced level of protection beyond that which is provided by the existing adequate protection requirements applicable to currently-operating power reactors.

The aircraft impact rule applies to applicants for new construction permits (CPs); new operating licenses that reference a new CP; new standard design certifications (DCs); renewal of any of the four existing DCs, if the design has not previously been amended to comply with the final rule; new standard design approvals (SDAs); manufacturing licenses that do not reference a standard DC or SDA, or that reference a standard DC issued before the effective date of the rule, which has not been amended to comply with the rule; and combined licenses (COLs) that do not reference a standard DC, SDA, or manufactured reactor, or that reference a standard DC issued before the effective date of the rule, which has not been amended to comply with the rule. All of these applicants, as a whole, are referred to as "applicants for new nuclear power reactors." These applicants are required to assess the effects on the designed facility of the impact of a large, commercial aircraft. Using realistic analyses, applicants must identify and incorporate into the design those design features and functional capabilities to show, with reduced use of operator action, that the reactor core remains cooled or the containment remains intact and spent fuel cooling or spent fuel pool integrity is maintained (referred to as "the acceptance criteria").

Applicants are not required to submit the aircraft impact assessment to the NRC in their applications. However, the assessment will be subject to inspection by the NRC and, therefore, must be maintained by the applicant. Applicants are required to describe, in their preliminary or final safety analysis reports, the design features and functional capabilities that show that the facility can withstand the effects of the aircraft impact. Applicants must also include a concise description of how such design features and functional capabilities meet the acceptance criteria of the rule. Applicants and licensees are

also subject to requirements for the control of changes to the design features and functional capabilities identified as a result of complying with the aircraft impact rule.

C. REGULATORY POSITION

1. NEI 07-13

The NRC staff (staff) considers conformance with the guidance in NEI 07-13, Revision 7, an acceptable method for use in satisfying the NRC's requirements in 10 CFR 50.150(a) regarding the assessment of aircraft impacts for new nuclear power reactors.

2. Other Documents Referenced in NEI 07-13

NEI 07-13 references other documents, but this draft RG does not endorse any of the referenced documents.

3. Use of Other Methods

Licensees or applicants may use methods other than those provided in NEI 07-13, Revision 7, to meet the requirements of 10 CFR 50.150(a). The staff will review such methods and determine their acceptability on a case-by-case basis.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the staff's plans for using this draft RG. The final aircraft impact rule, for which this draft RG provides guidance, included a backfit analysis (74 FR 28143; July 12, 2009). This draft RG presents the first instance of staff guidance on the new aircraft impact rule. Accordingly, the backfitting statement for the aircraft impact rule applies to this draft RG. No further consideration of backfitting is necessary for this draft RG. The NRC does not intend or approve any imposition or backfit in connection with its issuance beyond that addressed in the backfitting statement for the aircraft impact rule.

The NRC has issued this draft guide to encourage public participation in its development. The NRC will consider all public comments received in the development of the final guidance document. In some cases, applicants or licensees may propose an alternative or use a previously established acceptable alternative method for complying with specified portions of the NRC's regulations. Otherwise, the methods described in this guide will be used in evaluating compliance with the applicable regulations for performing assessments of the effects of the impact of a large, commercial aircraft on nuclear power plants by applicants.

REGULATORY ANALYSIS

The NRC staff did not prepare a separate regulatory analysis for this RG. The regulatory basis for this guide is the regulatory analysis prepared for 10 CFR 50.150 (74 FR 28111 (Ref. 3)). That regulatory analysis examined the costs and benefits of the rule as implemented by this guide. A copy of the *Federal Register* notice containing the regulatory analysis is available for inspection and may be copied (for a fee) at the NRC PDR, located at One White Flint North, 11555 Rockville Pike, Rockville, MD 20852.

REFERENCES[1]

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

2. NEI 07-13, "Methodology for Performing Aircraft Impact Assessments for New Plant Designs, Revision 7,", Nuclear Energy Institute, Washington, DC, May 2009, ADAMS Accession No. ML091490723.[2]

3. 74 FR 28111, "Consideration of Aircraft Impacts for New Nuclear Power Reactors; Final Rule," *Federal Register,* Volume 74, Number 112, pp. 28111 and 28143, Washington, DC, June 12, 2009.

4. 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," U.S. Nuclear Regulatory Commission, Washington, DC.

---

[1] Publicly available NRC published documents such as Regulations, Regulatory Guides, NUREGs, and Generic Letters listed herein are available electronically through the Electronic Reading Room on the NRC's public Web site at: http://www.nrc.gov/reading-rm/doc-collections/. Copies are also available for inspection or copying for a fee from 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 the non-NRC documents included in these references may be obtained directly from the publishing organization.