



# REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

## REGULATORY GUIDE 1.182

(Draft was issued as DG-1082)

### ASSESSING AND MANAGING RISK BEFORE MAINTENANCE ACTIVITIES AT NUCLEAR POWER PLANTS

#### A. INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) has amended the Maintenance Rule, 10 CFR 50.65, by adding a new paragraph (a)(4):

Before performing maintenance activities (including but not limited to surveillances, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. The scope of the assessment may be limited to structures, systems, and components that a risk-informed evaluation process has shown to be significant to public health and safety. [64 FR 38551, July 19, 1999, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"]

As of July 1998, Maintenance Rule Baseline Inspections at all U.S. nuclear power plant sites were complete. NRC staff experience during the baseline inspections indicated that all licensees have developed programs to implement the recommended pre-maintenance assessment provision of the original paragraph (a)(3). However, the baseline inspections identified a number of instances in which these assessments were not performed (including some that caused a significant increase in risk) and identified weaknesses in licensees' programs that could result in failures to perform adequate assessments prior to maintenance activities. Partly because of these inspection findings, the Commission approved the

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This guide was issued after consideration of comments received from the public. 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. Written comments may be submitted to the Rules and Directives Branch, ADM, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

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amendment to ensure that licensees assess and manage increases in risk associated with maintenance activities.

In a series of public meetings, the NRC staff met with industry representatives to discuss the change in the rule in relation to proposed revisions to Revision 2 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"<sup>1</sup> (May 1993). Revision 2 of NUMARC 93-01 was prepared by the Nuclear Energy Institute (NEI) and is endorsed by Revision 2 of Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."<sup>2</sup> Based in part on these discussions with industry representatives, this Regulatory Guide 1.182 provides guidance on implementing the provisions of 10 CFR 50.65(a)(4) by endorsing a revised Section 11 to NUMARC 93-01.

Regulatory Guide 1.182 will be used as a companion guide to Regulatory Guide 1.160 as guidance on methods acceptable to the NRC staff for assessing and managing the increase in risk that may result from maintenance activities and for implementing the optional reduction in scope of SSCs considered in the assessments.

The information collections contained in this regulatory guide are covered by the requirements of 10 CFR Part 50, which were approved by the Office of Management and Budget, approval number 3150-0011. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

## B. DISCUSSION

The objective of the Maintenance Rule, 10 CFR 50.65, is to require monitoring of the overall continuing effectiveness of licensee maintenance programs to ensure that (1) safety-related and certain nonsafety-related structures, systems, and components (SSCs) are capable of performing their intended functions, (2) for nonsafety-related equipment, failures will not occur that prevent the fulfillment of safety-related functions, and (3) failures resulting in scrams and unnecessary actuations of safety-related systems are minimized. (Note that, for Maintenance Rule purposes, the term "SSC" may denote a structure, system, or train. Although components may be monitored individually at the licensee's discretion, the Rule and its guidance generally do not require monitoring to that level of detail.)

The benefits of performing maintenance activities during power operations include increased system and plant reliability, reduction of plant equipment and system material condition

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<sup>1</sup>Copies are available for inspection or copying for a fee from the NRC Public Document Room at 2120 L Street NW., Washington, DC; the PDR's mailing address is Mail Stop LL-6, Washington, DC 20555; telephone (202)634-3273; fax (202)634-3343.

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deficiencies that could adversely impact plant operations, and reduction of work scope during plant refueling outages. However, relevant margins of safety could be inadvertently reduced under certain conditions, for example, if maintenance is performed at power without proper controls and careful consideration of risk. The intent of 10 CFR 50.65(a)(4) is to require that licensees perform assessments before maintenance activities are performed on SSCs covered by the Maintenance Rule and manage the increase in risk that may result from the proposed activities. The results of these assessments are to be used in conjunction with other regulatory requirements and, therefore, cannot be used as justification to perform activities which may not comply with other regulations.

Performing the assessment of Section 11 does not relieve the licensee from compliance with its license (including technical specifications) and applicable regulations. The intent of certain phrases in this guide is to eliminate overlapping requirements for assessments that could be considered to exist under 10 CFR 50.65(a)(4) and 10 CFR 50.59. This clarification applies to temporary alterations directly related to and required in support of the specific maintenance activity being assessed. (Note that when a maintenance activity to restore a degraded condition is planned, a compensatory measure already in place addressing that condition would have to be considered in the assessment under 10 CFR 50.65(a)(4) if the measure is to remain in place during the maintenance activity.)

### **C. REGULATORY POSITION**

Section 11, "Assessment of Risk Resulting from Performance of Maintenance Activities," dated February 11, 2000, of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," provides methods that are acceptable to the NRC staff for complying with the provisions of 10 CFR 50.65(a)(4). Section 11 references other documents, but NRC's endorsement of Section 11 should not be considered as endorsement of the referenced documents. Note that, in paragraph 1. of Section 11.3.7.2, the value " $10^{-3}/\text{year}$ " is suggested by the authors as a ceiling for configuration-specific core damage frequency. The subject of such a ceiling value is currently being studied by the NRC. At some later date, a similar or different value may be promulgated by the agency. At this time, the NRC neither endorses nor disapproves of the  $10^{-3}/\text{year}$  value.

### **D. IMPLEMENTATION**

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

Except in those cases in which a licensee or applicant proposes an acceptable alternative method for complying with specified portions of the NRC's regulations, the method described in this guide will be used with Regulatory Guide 1.160 in the evaluation of assessment processes before maintenance activities, management of the increases in risk from maintenance activities, and implementation of the option to reduce the scope of SSCs considered for the assessments.

## REGULATORY ANALYSIS

The regulatory analysis that was published with the July 19, 1999, revision to the Maintenance Rule, 10 CFR 50.65, is also applicable for this Regulatory Guide 1.182. A copy of the regulatory analysis is available for inspection or copying for a fee in the Commission's Public Document Room at 2120 L Street NW., Washington, DC, under task DG-1082.

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