ASME NUM-1–2016
(Revision of ASME NUM-1–2009)

Rules for Construction of Cranes, Monorails, and Hoists (With Bridge or Trolley or Hoist of the Underhung Type)

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FOREWORD

The Committee on Cranes for Nuclear Power Plants was first established in 1976. In 1980, the scope of the Committee was revised, and its name was changed to the Committee on Cranes for Nuclear Facilities. In 1983, the Nuclear Underhung and Monorail (NUM) Subcommittee was established to develop a standard to cover the design, fabrication, installation, and testing of underhung and monorail equipment used in nuclear facilities. The NUM-1 Standard is the result of the Subcommittee's work.

The first edition of ASME NUM-1 was approved by the American National Standards Institute (ANSI) on October 28, 1996. The second edition of ASME NUM-1 was approved by ANSI on May 3, 2000. The third edition of ASME NUM-1 was approved by ANSI on August 17, 2004. The fourth edition of ASME NUM-1 was approved by ANSI on December 22, 2009.

This Standard, or portions thereof, can be applied to cranes, monorails, and hoists at facilities other than nuclear where enhanced equipment safety may be required, and can be provided by means of single failure-proof features, enhanced safety features, or a seismic design.

This Standard is split into four major sections: NUM-G, General Specifications (applicable to all equipment); NUM-I, Type I equipment (i.e., equipment that is used to handle critical loads and is required to withstand a seismic event); NUM-II, Type II equipment (i.e., equipment that is not used to handle critical loads and is required to withstand a seismic event); and NUM-III, Type III equipment (i.e., equipment that is not used to handle critical loads and is not required to withstand a seismic event).

Suggestions for the improvement of this Standard are welcome. They should be addressed to the Secretary, ASME Committee on Cranes for Nuclear Facilities, The American Society of Mechanical Engineers, Two Park Avenue, New York, NY 10016-5990.

The 2016 edition of ASME NUM-1 was approved by ANSI on June 16, 2016.

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(The following is the roster of the Committee at the time of approval of this Standard.)

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PREPARATION OF TECHNICAL INQUIRIES TO THE COMMITTEE ON CRANES FOR NUCLEAR FACILITIES

INTRODUCTION

The ASME Committee on Cranes for Nuclear Facilities (CNF) will consider written requests for interpretations and revisions to CNF standards and develop new requirements if dictated by technological development. The Committee's activities in this regard are limited strictly to interpretations of the requirements or to consideration of revisions to the present Standard on the basis of new data or technology. As a matter of published policy, ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity and, accordingly, inquiries requiring such consideration will be returned. Moreover, ASME does not act as a consultant on specific engineering problems or on the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

All inquiries that do not provide the information needed for the Committee's full understanding will be returned.

INQUIRY FORMAT

Inquiries shall be limited strictly to interpretations of the requirements or to the consideration of revisions to the present Standard on the basis of new data or technology.

Requests for interpretation shall be submitted through the Interpretation Submittal Form found at http://go.asme.org/InterpretationRequest.

ASME NUM-1–2016
SUMMARY OF CHANGES

Following approval by the ASME Committee on Cranes for Nuclear Facilities and ASME, and after public review, ASME NUM-1–2016 was approved by the American National Standards Institute on June 16, 2016.

The 2016 Edition of ASME NUM-1 includes revisions, additions, deletions, corrections, and editorial changes introduced in ASME NUM-1–2009, as well as the following changes identified by a margin note, **(16)**, placed next to the affected area.

Page	*Location*	*Change*
4	NUM-G-3200	Reference to Nonmandatory Appendix A corrected
	NUM-G-3400	Paragraph (b) reference to Nonmandatory Appendix A corrected
8	NUM-G-4230	First paragraph reference to Nonmandatory Appendix A corrected
10	NUM-G-5200	First paragraph reference to Nonmandatory Appendix A corrected
11, 13	NUM-G-6100	Definitions of *braking torque*, *momentary peak load* added; definition of *reeving* updated; alphabetical order of some definitions updated
15	NUM-G-7100	References updated to latest editions; ANSI/AGMA 9002-B04, ANSI/AGMA 9003-B08, ANSI/AGMA 9103-B08, ANSI/AGMA 9112-A04 added
19	NUM-I-5400, NUM-I-5420	Added for proper nesting
21	NUM-I-7730, NUM-I-7740	Added for proper nesting
	NUM-I-7749	Added
	NUM-I-7931	Paragraph (c) references to figures updated
	Figure NUM-I-7931-1	Figure number updated
22	NUM-I-7942.1	Added for proper nesting
	Figure NUM-I-7931-2	Figure number updated
23	Figure NUM-I-7931-3	Figure number updated
24	NUM-I-7945	Paragraph (a) revised to add “keys”
26	NUM-I-7947	NUM-I-7947.1, NUM-I-7947.2, NUM-I-7947.6 added; NUM-I-7947.4 deleted; others redesignated
27	NUM-I-7950, NUM-I-7952	Added for proper nesting
	NUM-I-7970	Redesignated, reference to NUM-III-7970(a) updated
28	NUM-I-8212, NUM-I-8320, NUM-I-8332	Added for proper nesting
	NUM-I-8340, NUM-I-8345	Added

Page	*Location*	*Change*
29–30	Table NUM-I-8210-1	Note (3) reference to tables corrected
	NUM-I-8420	Added for proper nesting
36	NUM-I-8532	Added for proper nesting
40	NUM-II-8210	Added for proper nesting
	NUM-II-8213	Editorially revised
41	NUM-II-8215.3.5	Paragraph (c) equations renumbered
43, 44	Table NUM-II-8215.3.6-1	General Note added
	NUM-II-8215.3.10	Equations renumbered
45	NUM-II-8320, NUM-II-8410, NUM-II-8520, NUM-II-8521.2	Added for proper nesting
55	NUM-III-3222	Revised
60	NUM-III-4422	Motor sizing cross-reference corrected
63, 65	NUM-III-5422	Paragraph (b) editorially revised
72	NUM-III-6510	Paragraph (e) cross-reference corrected
76	Figure NUM-III-7210-1	Illustration (d) corrected
77, 78	NUM-III-7341	Paragraph (d) reference to table corrected
	Figure NUM-III-7410-1	Callouts added
80	Figure NUM-III-7510-1	Illustration (d) corrected
81	Figure NUM-III-7610-1	Callouts added
	NUM-III-7720	Reference to Nonmandatory Appendix A corrected
85	NUM-III-7945	Subparagraph (b)(2) revised, including equations
88	NUM-III-7953.2	Added new para. (b), others redesignated
91	NUM-III-8212.3	Paragraph (a) reference updated
	NUM-III-8213	Editorially revised
93	Figure NUM-III-8214-1	Caption updated
94	NUM-III-8231.2	Equations (9), (10) editorially revised; eq (11) corrected; equation numbers updated
	Figure NUM-III-8214-2	Caption updated
95	NUM-III-8231.4	Reference updated
	NUM-III-8232.1	Description of σ_b updated
96, 98	NUM-III-8232.3	(1) Subparagraph (a) nomenclature updated
		(2) Subparagraph (b) σt corrected in third paragraph
		(3) Subparagraph (f) description of τ corrected

Page	*Location*	*Change*
99	NUM-III-8233.2	Equation editorially revised
	NUM-III-8233.3	(1) Equation (43) corrected
		(2) Second column head of text table updated
	NUM-III-8233.4	Reference updated
100	Table NUM-III-8234.1-1	Revised
101–104	Table NUM-III-8234.1-2	Note (1) added
105	Figure NUM-III-8234.1-1	Parts 7, 13, and 31 corrected
107	NUM-III-8341.2	Revised, including equations
108	NUM-III-8343.5	Revised
114	Table NUM-III-8344.2-1	In Contour Tread straddle head, units corrected
118–119	NUM-III-8422.4	(1) Subparagraph (a)(1) definition of K_s updated
		(2) Subparagraph (b)(3) revised
120	Table NUM-III-8422.4-1	Units updated
135	NUM-A-1320	Table number corrected
144, 146	NUM-B-4100	(1) Subparagraph (a) last equation in section corrected
		(2) Subparagraph (b) penultimate equation in section corrected
		(3) Subparagraph (d) units for penultimate equation in section corrected
	NUM-B-4200	Deleted

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RULES FOR CONSTRUCTION OF CRANES, MONORAILS, AND HOISTS (WITH BRIDGE OR TROLLEY OR HOIST OF THE UNDERHUNG TYPE)

Section NUM-G-1000
Introduction

NUM-G-1100 GENERAL

(a) This Standard is split into the following four major sections:

(1) NUM-G: General Specifications, applicable to all equipment

(2) NUM-I: Type I equipment, i.e., equipment that is used to handle critical loads and is required to withstand a seismic event (see Section NUM-G-6000)

(3) NUM-II: Type II equipment, i.e., equipment that is not used to handle critical loads and is required to withstand a seismic event (see Section NUM-G-6000)

(4) NUM-III: Type III equipment, i.e., equipment that is not used to handle critical loads and is not required to withstand a seismic event (see Section NUM-G-6000)

(b) Equipment covered under this Standard shall be designed in accordance with the Standard's requirements, but not necessarily with its recommendations. The word "shall" is used to denote a requirement, the word "should" is used to denote a recommendation, and the word "may" is used to denote permission, which is neither a requirement nor a recommendation.

NUM-G-1200 SCOPE

This Standard covers underhung cranes, top-running bridge and gantry cranes with underhung trolleys, traveling wall cranes, jib cranes, monorail systems, overhead hoists, and hoists with integral trolleys used in nuclear facilities. All of the above cranes, whether single or multiple girder, are covered by this Standard with the exception of multiple-girder cranes with both top-running bridge and trolley, which are covered by ASME NOG-1.

NUM-G-1300 APPLICATIONS

This Section of the Standard applies to the design, manufacture, testing, inspection, shipment, storage, and erection of the cranes, hoists, and monorails covered by this Standard.

NUM-G-1400 RESPONSIBILITY

The equipment covered by this Standard is classified into three types (see Section NUM-G-6000, equipment Types I, II, and III) depending on the equipment location and usage of the equipment at a nuclear facility.

The owner shall be responsible for determining and specifying the equipment type. The owner shall also be responsible for determining and specifying the environmental conditions of service, performance requirements, type and category of coatings and finishes, and degree of quality assurance.

Determining the extent to which this Standard can be used either in part or in its entirety at other than nuclear facilities shall be the responsibility of those referencing the use of the Standard.