ASME NOG-1–2015
(Revision of ASME NOG-1–2010)

Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

INTENTIONALLY LEFT BLANK

ASME NOG-1–2015
(Revision of ASME NOG-1–2010)

Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers
Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: February 20, 2015

The next edition of this Standard is scheduled for publication in 2020.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Interpretations are published on the ASME Web site under the Committee Pages at http://cstools.asme.org/ as they are issued.

Errata to codes and standards may be posted on the ASME Web site under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

The Committee Pages can be found at http://cstools.asme.org/. There is an option available to automatically receive an e-mail notification when errata are posted to a particular code or standard. This option can be found on the appropriate Committee Page after selecting "Errata" in the "Publication Information" section.

The American Society of Mechanical Engineers
Two Park Avenue, New York, NY 10016-5990

CONTENTS

Figures

Tables

FOREWORD

The Committee on Cranes for Nuclear Power Plants was first established in 1976. In 1980, the name and scope of the Committee were revised from the Committee on Cranes for Nuclear Power Plants to the Committee on Cranes for Nuclear Facilities. This Standard was developed under procedures accredited as meeting the criteria for American National Standards. The Standards committee that approved the Standard was balanced to ensure that individuals from competent and concerned interests have had an opportunity to participate.

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

Suggestions for improvement as gained in the use of this Standard are welcome. They should be sent 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 first edition of NOG-1 was approved in 1983, the second in 1989, the third in 1995, the fourth in 1998, the fifth in 2002, and the sixth in 2004. This 2014 edition contains the revisions made since the 2010 edition; most significant of these is the addition of Mandatory Appendix II on criteria required for structural qualification of an existing crane bridge for use with an ASME NOG-1 Type I hoist and trolley. Mandatory Appendix II parallels the U.S. Nuclear Regulatory Commission's guidance for modification of existing cranes for compliance with NUREG-0554, as presented in NUREG-0612 Nonmandatory Appendix C. ASME NOG-1–2015 received ANSI approval on January 8, 2015.

ASME COMMITTEE ON CRANES FOR NUCLEAR FACILITIES

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

STANDARDS COMMITTEE OFFICERS

A. S. Kureck, *Chair*
S. Parkhurst, *Vice Chair*
G. M. Ray, *Vice Chair*
L. Powers, *Secretary*

STANDARDS COMMITTEE PERSONNEL

B. K. Barber, Navy Crane Center
S. W. Butler, Kennecott Utah Copper
T. Finnegan, Lockheed Martin Space Systems
A. Reisner, *Alternate,* Lockheed Martin Space Systems
M. B. Fitzsimmons, Constellation Energy Group
J. N. Fowler, DP Engineering Ltd. Co.
L. C. Fraser, Newport News Shipbuilding
W. A. Horwath, Whiting Corp.
D. Weber, *Alternate,* Whiting Corp.
S. Huffard, URS Corp.
S. R. Jones, U.S. Nuclear Regulatory Commission
J. Knight, Bechtel Marine Propulsion Corp.
J. Konop, PaR Systems
J. B. Kriner, Beckman & Associates
A. S. Kureck, Magnetek Material Handling
J. A. Wellnitz, *Alternate,* Magnetek Material Handling
C. Larouche, COH, Inc.
S. M. Lawrence, Konecranes Nuclear Equipment & Services, LLC
J. D. Edmundson, *Alternate,* Konecranes Nuclear Equipment & Services, LLC
R. C. Lindberg, Sargent & Lundy, LLC
B. P. Lytle, NASA Kennedy Space Center
S. Parkhurst, Material Handling Equipment, Inc.
D. L. Borska, *Alternate,* Material Handling Equipment, Inc.
R. J. Parler, AREVA
L. Powers, The American Society of Mechanical Engineers
G. M. Ray, Tennessee Valley Authority
B. B. Bacon, *Alternate,* Tennessee Valley Authority
J. Schulz, Westinghouse
S. Henderson, *Alternate,* Westinghouse
N. E. Skogland, Eureka Engineering, LLC
G. A. Townes, Be, Inc.
T. V. Vine, GDF Suez
J. L. Weamer, Bechtel National, Inc.
T. A. Wetzel, American Crane and Equipment Corp.

SUBCOMMITTEE ON OPERATION AND MAINTENANCE FOR CRANES

G. M. Ray, *Chair,* Tennessee Valley Authority
L. S. Gibbs, Southern Nuclear
R. D. Hagler, Pacific Gas & Electric Co.
D. E. Klasel, Ace World Companies
S. McArdle, NEIL
C. A. White, U.S. Department of Energy

SUBCOMMITTEE ON ENGINEERING SUPPORT

D. Weber, *Chair,* Whiting Corp.
K. Axelson, Zion
J. Griesemer, American Crane & Equipment Corp.
L. D. Jones, NASA Kennedy Space Center
H. Pratt, Crane Powerline Safety Organization
S. Raymond, COH, Inc.
D. T. Tang, U.S. Nuclear Regulatory Commission

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 the 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.

Inquiries shall be submitted in the following format:

(a) Scope. The inquiry shall involve a single requirement or closely related requirements. An inquiry letter concerning unrelated subjects will be returned.

(b) Background. State the purpose of the inquiry, which would be either to obtain an interpretation of the Standard or to propose consideration of a revision to the present Standard. Provide concisely the information needed for the Committee's understanding of the inquiry, being sure to include reference to the applicable Standard, Edition, Requirements, Parts, Subparts, Appendices, paragraphs, figures, and tables. If sketches are provided, they shall be limited to the scope of the inquiry.

(c) Inquiry Structure

(1) Proposed Question(s). The inquiry shall be stated in a condensed and precise question format, omitting superfluous background information and, where appropriate, composed in such a way that "yes" or "no" (perhaps with provisos) would be an acceptable reply. The inquiry statement should be technically and editorially correct.

(2) Proposed Reply(ies). State what it is believed that the Standard requires. If, in the inquirer's opinion, a revision to the Standard is needed, recommended wording shall be provided.

(d) Submittal. The inquiry shall be submitted in typewritten form; however, legible, handwritten inquiries will be considered. It shall include the name, mailing address, and telephone number of the inquirer and be mailed to the following address:

Secretary
ASME Committee on Cranes for Nuclear
Facilities
Nuclear Department
Two Park Avenue
New York, NY 10016

ASME NOG-1–2015
SUMMARY OF CHANGES

Following approval by the ASME Committee on Cranes for Nuclear Facilities and ASME, and after public review, ASME NOG-1–2015 was approved by the American National Standards Institute on January 8, 2015.

ASME NOG-1–2015 includes the following changes identified by a margin note, **(15)**.

Page	*Location*	*Change*
8, 9	1160	Updated
14	4110	Revised
	4120	Nomenclature of P_{vi} revised
33	4332.1	Equations under "Design Factor *DFB*" revised
34, 35	4341	(1) First paragraph revised (2) Original second paragraph deleted
	4342	Revised
	4345	First paragraph and subpara. (a) revised
39	5100	Paragraph added
40	5161	Nomenclature revised in its entirety
42	5210	Revised in its entirety
43	Table 5331.1-1	First column head revised
44–46	Table 5332.1-1	First column head revised
	Table 5333.1-1	First column head revised
	5411.3	Revised in its entirety
	5411.5	Revised in its entirety
	Fig. 5411.5-1	Revised in its entirety
	5411.7	(1) Subparagraph (b) revised (2) Subparagraph (c) deleted
51	Table 5415.1-1	(1) Penultimate column and Note (2) revised (2) Note (4) added
55, 57, 58, 60, 62	5423.1	Subparagraph (c)(9) added
	5427.1	First paragraph revised
	5430	Subparagraph (a)(6) revised
59	Fig. 5427.1-1	(1) Revised (2) General Notes added
60	Fig. 5427.1-2	(1) Revised (2) General Notes added
61	Fig. 5430-1	A-4 Drive illustration revised

Page	*Location*	*Change*
62, 65	5440	Subparagraph (a)(4) revised
63	Fig. 5440-1	A-4 Drive illustration revised
65	5451.1	(1) Subparagraph (a) revised (2) Last sentence in subpara. (b) deleted
87	6415.1	Subparagraph (c) added
89, 90	6422.1	Subparagraph (e) added
	6422.2	Last paragraph added
91	6441	(1) Revised in its entirety (2) Paragraph 6441.1 added
92	6444	Revised in its entirety
93, 94	6472.2	Last sentence added to definition of K_a nomenclature in subpara. (c)
98	6473	First sentence, eq. (12), and definition of D revised
102	7240	Subparagraph (l) revised
104	Table 7210-1	Third entry in first column revised
111	7423	Subparagraph (b)(3) revised
112, 113	7521.3	Subparagraph (b)(12) added
118	I-5111	Added
120–124	Mandatory Appendix II	Added
142	NUREG-0554/ASME NOG-1 Conformance Matrix	(1) Last entry in fourth column revised (2) Last entry in last column deleted

RULES FOR CONSTRUCTION OF OVERHEAD AND GANTRY CRANES (TOP RUNNING BRIDGE, MULTIPLE GIRDER)

Section 1000 Introduction

1100 GENERAL

Cranes 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.

1110 Scope

This Standard covers electric overhead and gantry multiple girder cranes with top running bridge and trolley used at nuclear facilities and components of cranes at nuclear facilities.

1120 Applications

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

1130 Responsibility

The cranes covered by this Standard are classified into three types (see para. 1150, Definitions, *crane, Type*), depending upon crane location and usage of the crane at a nuclear facility.

The owner shall be responsible for determining and specifying the crane type. The owner shall also be responsible for determining and specifying the environmental conditions of service, performance requirements, type and service level 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 this Standard.

1140 Environmental Conditions (Types I, II, and III Cranes)

1141 Radiation

(a) The purchase specification shall specify the accumulated radiation dosage expected to be seen by the crane in the life of the nuclear facility.

(b) Components whose normal life could be reduced by the effects of the specified radiation shall be tabulated and submitted to the crane purchaser.

(c) Components whose failure, due to radiation, could result in loss of one of the single-failure-proof features that hold the load either shall be designed to withstand the specified radiation or shall have a specific replacement period. Where state-of-the-art is such that sufficient data are not available, periodic inspections shall be made by the purchaser to determine when replacement should be made.

1142 Temperature

(a) The purchase specification shall specify the following temperature requirements in the area where the crane operates:

(1) maximum operating temperature
(2) minimum operating temperature
(3) ambient temperature for motors
(4) maximum construction temperature
(5) minimum construction temperature

(b) The crane shall be designed to withstand the effects of the specified temperatures, or the limitations of the crane's design concerning these temperature conditions shall be specified by the crane designer.

1143 Pressure

(a) The purchase specification shall specify the following pressure requirements in the area where the crane operates:

(1) normal operating pressure

(2) any test or abnormal event of these pressures including the rate of change