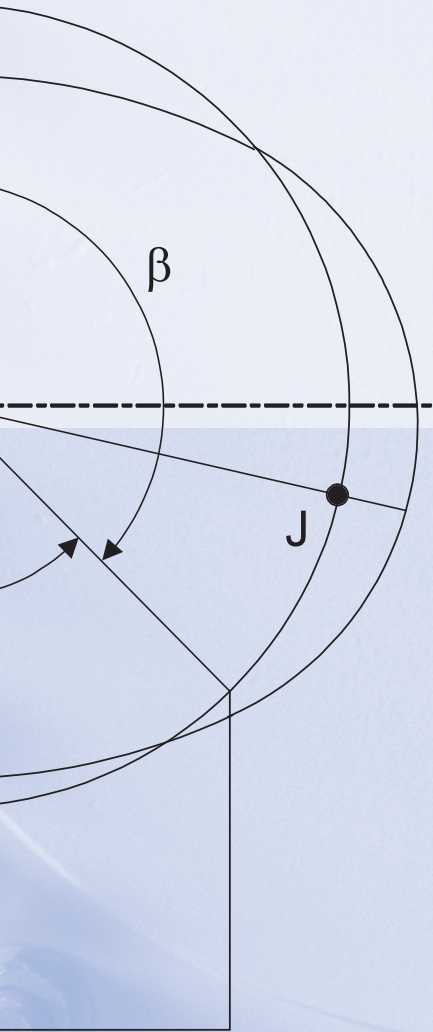


2013 ASME Boiler and Pressure Vessel Code

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Fiber-Reinforced Plastic Pressure Vessels



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2013 ASME Boiler & Pressure Vessel Code

2013 Edition

July 1, 2013

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FIBER-REINFORCED PLASTIC PRESSURE VESSELS

ASME Boiler and Pressure Vessel Committee
on Fiber-Reinforced Plastic Pressure Vessels



The American Society of
Mechanical Engineers

Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: July 1, 2013

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Library of Congress Catalog Card Number: 56-3934
Printed in the United States of America

Adopted by the Council of The American Society of Mechanical Engineers, 1914; latest edition 2013.

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

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TABLE OF CONTENTS

List of Sections	x
Foreword	xii
Statement of Policy on the Use of the Certification Mark and Code Authorization in Advertising	xiv
Statement of Policy on the Use of ASME Marking to Identify Manufactured Items	xiv
Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees	xv
Personnel	xvii
Introduction	xxxii
Summary of Changes	xxxvi
List of Changes in Record Number Order	xxxviii
Cross-Referencing and Stylistic Changes in the Boiler and Pressure Vessel Code	xxxix
Part RG	
General Requirements	1
Article RG-1	
Scope and Jurisdiction	1
RG-100 Scope	1
RG-110 Application Limitations	1
RG-120 Jurisdiction of Section X	2
Article RG-2	
Organization	3
RG-200 Organization of this Section	3
Article RG-3	
Responsibilities and Duties	4
RG-300 Responsibilities and Duties	4
RG-310 User's Responsibilities — Design Specification	4
RG-320 Fabricator's Responsibilities	4
RG-330 Inspector's Duties	6
Article RG-4	
Fabrication Methods	7
RG-400 Fabrication Methods	7
Part RM	
Material Requirements	8
Article RM-1	
General Requirements	8
RM-100 Laminate Materials	8
RM-110 Fiber System	8
RM-120 Resin System	8
RM-140 Use of Two or More Materials Specifications or Processes in Fabricating a Class I Vessel	10
RM-150 Mechanical Properties of Lamina for Class II Vessels	10
Article RM-2	
Miscellaneous Pressure Parts	11
RM-200 General Requirements	11
RM-210 Miscellaneous Metallic Parts	11
Part RD	
Design Requirements	12
Article RD-1	
General	12
RD-100 Scope	12
RD-110 Definitions	12
RD-120 Loadings	13

RD-130	Design Restrictions	14
RD-140	Design Allowances for Degradation	14
RD-150	Methods of Fabrication in Combination	14
RD-160	Proof of Design Adequacy	14
Article RD-2	Shells of Revolution Under Internal Pressure	15
RD-200	General	15
Article RD-3	Shells of Revolution Under External Pressure	16
RD-300	General	16
RD-310	Qualification of Vessels for External Pressure Service	16
Article RD-4	Secondary Bonding	17
RD-400	Design of Secondary Bonded Joints	17
Article RD-5	Openings and their Reinforcement	18
RD-500	General	18
RD-510	Qualification	18
RD-520	Restrictions for Class II Vessels	18
Article RD-6	Nozzles and Other Connections	19
RD-600	General	19
RD-610	Qualifications	19
RD-620	Integral Flanged Nozzles for Class II Vessels	19
Article RD-7	Bolted Connections	27
RD-700	Flat Heads, Covers, and Blind Flanges	27
RD-710	Bolted Flanged Connections	27
RD-720	Openings in Flat Metallic Heads, Metallic Covers, and Metallic Blind Flanges	28
RD-730	Welded or Brazed Connections to Metal Flat Heads, Covers, or Blind Flanges	28
Article RD-8	Quick-Actuating Closures (For Class I Vessels Only)	29
RD-800	General Design Requirements	29
Article RD-9	Attachments and Supports	30
RD-900	General	30
RD-910	Qualification	30
Article RD-10	Access and Inspection Openings	31
RD-1000	General Requirements	31
RD-1010	Equipment of Vessels Requiring Access or Inspection Openings	31
RD-1020	Size of Manhole Openings for Class I Vessels	31
RD-1030	Size of Manhole Openings for Class II Vessels	31
RD-1040	Minimum Gasket Bearing Widths for Manhole Cover Plates	32
RD-1050	Threaded Openings in Class I Vessels	32
RD-1060	Threaded Openings in Class II Vessels	32
Article RD-11	Mandatory Design Rules for Class II Vessels	33
RD-1100	General	33
RD-1110	Design Basis	33
RD-1120	Design Limitations	33
RD-1130	Design Acceptability	33
RD-1140	Loadings	33
RD-1150	Vessel Parts Subject to Design Analysis	33
RD-1160	Laminate Composition	33
RD-1170	Design Rules — Method A	35
RD-1180	Discontinuity Analysis — Method B	43
Article RD-12	Laminate Stiffness Coefficients	53
RD-1200	Laminate Stiffness Coefficients	53
RD-1210	Stiffness Coefficients for Design by Method B Rules	53

RD-1220	Nomenclature	53
RD-1230	Lamina Reduced Stiffness	55
RD-1240	Stiffness Coefficients for the Laminate	56
RD-1250	Procedure for Calculating the Stiffness Coefficients	56
Part RF	Fabrication Requirements	58
Article RF-1	General Requirements	58
RF-100	Scope	58
RF-110	Procedure Specifications	58
Article RF-2	Special Fabrication Requirements for Bag-Molding Process (for Class I Vessels Only)	59
RF-200	Fiber Content	59
RF-210	Form of Fiber Reinforcement	59
RF-220	Molds	60
RF-230	Liners	60
RF-240	Openings in Vessels	60
RF-250	Molded-in Fittings	60
Article RF-3	Special Fabrication Requirements for Centrifugal-Casting Process (for Class I Vessels Only)	61
RF-300	Fiber Content	61
RF-310	Form of Reinforcement	61
RF-320	Mandrels	61
RF-330	Liners	61
RF-340	Openings in Vessels	61
Article RF-4	Special Fabrication Requirements for Filament-Winding Process (Classes I and II)	62
RF-400	Fiber Content	62
RF-410	Form of Reinforcement	62
RF-420	Mandrels	62
RF-430	Liners	63
RF-440	Openings in Vessels	63
Article RF-5	Special Fabrication Requirements for Contact-Molding Process (Classes I and II)	64
RF-500	Fiber Content	64
RF-510	Form of Fiber Reinforcement	64
RF-520	Molds	64
RF-530	Liners	64
RF-540	Openings in Vessels	65
Article RF-6	Special Fabrication Requirements for Matched Molded Heads (Used for Closures for Centrifugally Cast Vessels — for Class I Vessels Only) .	66
RF-600	Content	66
RF-610	Form of Fiber Reinforcement	66
RF-620	Molds	66
RF-630	Openings in Heads	67
Article RF-7	Special Fabrication Requirements for Joining Components	68
RF-700	Procedure Specifications and Qualifications	68
Part RQ	Qualification Requirements	69
Article RQ-1	Scope	69
RQ-100	Responsibility for Qualification	69
RQ-110	Maintenance of Procedure Specification and Qualification Records	69

RQ-120	Procedure Specification Qualification Forms	69
RQ-130	Means to be Used in Qualifying Class I Designs and Fabricating Procedures	70
RQ-140	Means for Qualifying Class II Vessel Design and Fabrication	70
Article RQ-2	Special Requirements for Bag-Molding Procedure Qualification (Class I Vessels)	72
RQ-200	Essential Variables	72
Article RQ-3	Special Requirements for Centrifugal-Casting Procedure Qualification (Class I Vessels)	73
RQ-300	Essential Variables	73
Article RQ-4	Special Requirements for Filament-Winding Procedure Qualification (Class I Vessels)	74
RQ-400	Essential Variables	74
Article RQ-5	Special Requirements for Contact-Molding Procedure Qualification (Class I Vessels)	75
RQ-500	Essential Variables	75
Article RQ-6	Special Requirements for Class II Vessels	76
RQ-600	Essential Design Variables	76
Part RR	Pressure Relief Devices	77
Article RR-1	General Requirements	77
RR-100	Protection Against Overpressure	77
RR-110	Types of Overpressure Protection	77
RR-120	Set Pressure	77
RR-130	Permissible Overpressures	77
Article RR-2	Provisions in Vessels for Installation of Pressure Relief Devices	78
RR-200	Number, Size, and Location of Connections	78
RR-210	Stop Valves Between the Vessel and Pressure Relief Device	78
RR-220	Discharge Lines From Pressure Relief Devices	78
Part RT	Rules Governing Testing	79
Article RT-1	Testing Requirements	79
RT-100	Scope	79
RT-110	Fabricator's Responsibility	79
RT-120	Inspector's Duties	79
Article RT-2	Design and Procedure Qualification Test Requirements for Class I Vessels	80
RT-200	General	80
RT-210	Qualification Checks and Examinations	80
RT-220	Qualification Tests	81
Article RT-3	Quality Control Test and Examination Requirements for Class I Vessels	83
RT-300	General	83
RT-310	Frequency of Cyclic Pressure and Qualification Pressure Tests	83
RT-320	Frequency of Determination of Weight of Resin and Fiber	83
RT-330	Frequency of Volumetric Expansion Tests	83
RT-340	Frequency of Thickness Checks	83
Article RT-4	Production Test Requirements for Class I Vessels	84
RT-400	General	84
RT-410	Visual Examination	84
RT-420	Thickness Check	85
RT-430	Vessel Weight	85
RT-440	Barcol Hardness Test	85

RT-450	Hydrostatic Leakage Test	85
RT-460	Conditions under which Pneumatic Leakage Test may be Used	85
Article RT-5	Hydrostatic Testing Procedures and Equipment for Class I and Class II Vessels	87
RT-500	Provision of Vents at High Points	87
RT-510	Test Gages	87
RT-520	Calibration of Acoustic Emission Equipment	87
Article RT-6	Acceptance Test Procedure for Class II Vessels	88
RT-600	General	88
RT-610	Acceptance Checks and Examinations	88
RT-620	Acceptance Tests	88
RT-630	Penetrant Examination	89
Article RT-7	Determination of Mechanical Properties of Lamina for Use with Class II Vessels	90
RT-700	Required Mechanical Properties of the Lamina	90
Article RT-8	Test Methods for Determining Damage-Based Design Criterion	92
RT-800	Scope	92
RT-810	Referenced Documents	92
RT-820	Apparatus, Loading Procedure, and Data Analysis	92
Part RI	Inspection Requirements	93
Article RI-1	General	93
RI-100	Scope	93
RI-110	Qualification of Inspectors	93
RI-120	Access for Inspector	93
RI-130	Inspector's Duties	93
RI-140	Inspection of Material	94
RI-150	Inspection During Fabrication	94
RI-160	Alternative Inspection for Multiple, Duplicate Fabrication	94
Article RI-2	Special Inspection Requirements for Bag Molding (Class I Vessels) ..	95
RI-200	Check of Bag-Molding Procedure Specification Qualification	95
RI-210	Visual Inspection	95
Article RI-3	Special Inspection Requirements for Centrifugal Casting (Class I Vessels)	96
RI-300	Check of Centrifugal-Casting Procedure Specification Qualification	96
RI-310	Visual Inspection	96
Article RI-4	Special Inspection Requirements for Filament Winding	97
RI-400	Check of Filament-Winding Procedure Specification Qualification	97
RI-410	Visual Inspection	97
Article RI-5	Special Inspection Requirements for Contact Molding	98
RI-500	Check of Contact-Molding Procedure Specification Qualification	98
RI-510	Visual Inspection	98
Part RS	Marking, Stamping, and Reports	99
Article RS-1	Contents, Methods, and Means of Marking	99
RS-100	Required Marking for Vessels	99
RS-110	Application of Stamp to Vessel	99
RS-120	Part Marking	100
RS-130	Nameplate	100
Article RS-2	Use of Certification Mark Stamp	101
RS-200	Certification Mark Stamp Bearing Official Mark	101

Article RS-3	Report Forms	102
RS-300	Fabricator's Data Reports	102
Mandatory Appendix 1	Quality Control System	103
Mandatory Appendix 2	Capacity Conversions for Safety Valves	105
Mandatory Appendix 4	Glossary of Terms Related to Fiber-Reinforced Plastics	109
Mandatory Appendix 5	Specific Gravity of Liquid Resins	118
Mandatory Appendix 6	Structural Laminate Visual Acceptance Criteria	119
Mandatory Appendix 7	Standard Units for Use in Equations	124
Mandatory Appendix 8	Class III Vessels With Liners for Gaseous Hydrogen in Stationary Service	125
Mandatory Appendix 9	Establishing Governing Code Editions, Addenda, and Cases for FRP Pressure Vessels	146
Nonmandatory Appendix AA	Suggested Methods of Preliminary Design for Class I Vessels	148
Nonmandatory Appendix AB	Installation and Operation	156
Nonmandatory Appendix AC	Discontinuity Stresses for Class II, Method B Vessels	158
Nonmandatory Appendix AD	Laminate Theory	176
Nonmandatory Appendix AF	Examples for Design Rules for Class II Vessels	191
Nonmandatory Appendix AG	Guide to Information Appearing on Certificate of Authorization (See Figure AG-1)	194
Nonmandatory Appendix AH	Guidance for the Use of U.S. Customary and SI Units in the ASME Boiler and Pressure Vessel Code	196
Nonmandatory Appendix AI	Rigorous NASA SP-8007 Solution for Lateral and Longitudinal Pressure	199
Nonmandatory Appendix AJ	Forms Required by Section X	203
FIGURES		
RD-620.3	Flange Tolerances	23
RD-620.4(a)	Plate-Type Gussets	24
RD-620.4(b)	Typical Cone-Type Gusset	24
RD-620.5	Flush Nozzle Installation	25
RD-620.6	Penetrating Nozzle Installation	26
RD-700.1	Acceptable Types of Flat Heads for Class I Vessels	27
RD-1120.1	Design Limitations for Class II Vessels	34
RD-1174.2	Dimensions of Reinforcing Pad and Nozzle Overlays	38
RD-1174.3	Stress Concentration Factors for a Circular Hole in a Pressurized Cylindrical Shell	40
RD-1175.2	Head/Shell or Shell/Shell Overlay Dimensions	42
RD-1176.1	Design of Full-Face Nozzle Flanges	44
RD-1176.2	Values of V	46
RD-1176.3	Values of F	47
RD-1176.4	Values of f	48
RD-1176.5	Values of T , Z , Y , and U	49
RD-1220.1	Moment Resultants	54
RD-1220.2	In-Plane Force Resultants	54
RD-1220.3	Coordinate Systems	55
RD-1250.1	Geometry of an N -Layered Laminate	57
RF-210.1	Fiber Side Wall Lay-up for Bag Molding	59
RF-210.2	Head or End Preform for Cylindrical Vessel	59

RF-610.1	Fiber Preform and Insert for Head for Centrifugally Cast Vessel	66
RF-610.2	Fiber Head or End Preformed Inserts for Centrifugally Cast Vessel Heads	67
RS-100.1	Official Certification Mark to Denote the American Society of Mechanical Engineers' Standard	99
RS-132.1	Form of Stamping and Marking	100

TABLES

1.1	Referenced Standards in this Section	xxxiii
RM-120.1	Resin Systems Required Certification by Resin Manufacturer	9
RM-120.2	Resin Systems Required Test by Vessel Fabricator	9
RD-620.1	Flange and Nozzle Dimensions for Hand Lay-Up and Pressure Molded Flanges	21
RD-1173.2	Values of Spherical Radius Factor K_o for Ellipsoidal Heads With Pressure on Convex Side	37
RT-620.1	Evaluation Criteria	89

FORMS

CPV-1	Fabricator's Data Report for Composite Reinforced Pressure Vessels (Class III)	140
CPV-2	Recommended Form for Qualifying the Laminate Design and the Laminate Procedure Specification used in the Fabrication of Composite Reinforced Pressure Vessels (Class III)	143
Q-106	Recommended Form For Qualifying The Vessel Design And The Procedure Specification Used In Fabricating Bag-Molded And Centrifugally Cast Fiber-Reinforced Plastic Pressure Vessels (Class I)	204
Q-107	Recommended Form For Qualifying The Vessel Design And The Procedure Specification Used In Fabricating Filament-Wound Fiber-Reinforced Plastic Pressure Vessels (Class I)	206
Q-108	Recommended Form For Qualifying The Vessel Design And The Procedure Specification Used In Fabricating Contact-Molded, Fiber-Reinforced Plastic Pressure Vessels (Class I)	208
Q-115	Recommended Form For Qualifying The Design And The Procedure Specification Used In Adhesive Bonding Of Parts Of Fiber-Reinforced Plastic Pressure Vessels (Class I)	211
Q-120	Procedure Specification For Class II Vessels	215
RP-1	Fabricator's Data Report For Fiber-Reinforced Plastic Pressure Vessels (Class I)	225
RP-2	Fabricator's Partial Data Report (Class I)	228
RP-3	Fabricator's Data Report For Class II Vessels	231
RP-4	Fabricator's Partial Data Report For Class II Vessels	234
RP-5	Fabricator's Data Report Supplementary Sheet	237

ENDNOTES	239
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LIST OF SECTIONS

SECTIONS

- I Rules for Construction of Power Boilers
- II Materials
 - Part A — Ferrous Material Specifications
 - Part B — Nonferrous Material Specifications
 - Part C — Specifications for Welding Rods, Electrodes, and Filler Metals
 - Part D — Properties (Customary)
 - Part D — Properties (Metric)
- III Rules for Construction of Nuclear Facility Components
 - Subsection NCA — General Requirements for Division 1 and Division 2
 - Appendices
 - Division 1
 - Subsection NB — Class 1 Components
 - Subsection NC — Class 2 Components
 - Subsection ND — Class 3 Components
 - Subsection NE — Class MC Components
 - Subsection NF — Supports
 - Subsection NG — Core Support Structures
 - Subsection NH — Class 1 Components in Elevated Temperature Service
 - Division 2 — Code for Concrete Containments
 - Division 3 — Containments for Transportation and Storage of Spent Nuclear Fuel and High Level Radioactive Material and Waste
 - Division 5 — High Temperature Reactors
- IV Rules for Construction of Heating Boilers
- V Nondestructive Examination
- VI Recommended Rules for the Care and Operation of Heating Boilers
- VII Recommended Guidelines for the Care of Power Boilers
- VIII Rules for Construction of Pressure Vessels
 - Division 1
 - Division 2 — Alternative Rules
 - Division 3 — Alternative Rules for Construction of High Pressure Vessels
- IX Welding and Brazing Qualifications
- X Fiber-Reinforced Plastic Pressure Vessels
- XI Rules for Inservice Inspection of Nuclear Power Plant Components
- XII Rules for Construction and Continued Service of Transport Tanks

INTERPRETATIONS

ASME issues written replies to inquiries concerning interpretation of technical aspects of the Code.

Interpretations of the Code are posted in January and July at <http://cstools.asme.org/interpretations.cfm>. Any Interpretations issued during the previous two calendar years are included with the publication of the applicable Section of the Code. Interpretations of Section III, Divisions 1 and 2 and Section III Appendices are included with Subsection NCA.

CODE CASES

The Boiler and Pressure Vessel Code committees meet regularly to consider proposed additions and revisions to the Code and to formulate Cases to clarify the intent of existing requirements or provide, when the need is urgent, rules for materials or constructions not covered by existing Code rules. Those Cases that have been adopted will appear in the appropriate 2013 Code Cases book: “Boilers and Pressure Vessels” or “Nuclear Components.” Supplements will be sent automatically to the purchasers of the Code Cases books up to the publication of the 2015 Code.

FOREWORD

(This Foreword is provided as an aid to the user and is not part of the rules of this Code.)

In 1911, The American Society of Mechanical Engineers established the Boiler and Pressure Vessel Committee to formulate standard rules for the construction of steam boilers and other pressure vessels. In 2009, the Boiler and Pressure Vessel Committee was superseded by the following committees:

- (a) Committee on Power Boilers (I)
- (b) Committee on Materials (II)
- (c) Committee on Construction of Nuclear Facility Components (III)
- (d) Committee on Heating Boilers (IV)
- (e) Committee on Nondestructive Examination (V)
- (f) Committee on Pressure Vessels (VIII)
- (g) Committee on Welding and Brazing (IX)
- (h) Committee on Fiber-Reinforced Plastic Pressure Vessels (X)
- (i) Committee on Nuclear Inservice Inspection (XI)
- (j) Committee on Transport Tanks (XII)

Where reference is made to “the Committee” in this Foreword, each of these committees is included individually and collectively.

The Committee's function is to establish rules of safety relating only to pressure integrity, which govern the construction^{*} of boilers, pressure vessels, transport tanks, and nuclear components, and the inservice inspection of nuclear components and transport tanks. The Committee also interprets these rules when questions arise regarding their intent. This Code does not address other safety issues relating to the construction of boilers, pressure vessels, transport tanks, or nuclear components, or the inservice inspection of nuclear components or transport tanks. Users of the Code should refer to the pertinent codes, standards, laws, regulations, or other relevant documents for safety issues other than those relating to pressure integrity. Except for Sections XI and XII, and with a few other exceptions, the rules do not, of practical necessity, reflect the likelihood and consequences of deterioration in service related to specific service fluids or external operating environments. In formulating the rules, the Committee considers the needs of users, manufacturers, and inspectors of pressure vessels. The objective of the rules is to afford reasonably certain protection of life and property, and to provide a margin for deterioration in service to give a reasonably long, safe period of usefulness. Advancements in design and materials and evidence of experience have been recognized.

This Code contains mandatory requirements, specific prohibitions, and nonmandatory guidance for construction activities and inservice inspection and testing activities. The Code does not address all aspects of these activities and those aspects that are not specifically addressed should not be considered prohibited. The Code is not a handbook and cannot replace education, experience, and the use of engineering judgment. The phrase *engineering judgement* refers to technical judgments made by knowledgeable engineers experienced in the application of the Code. Engineering judgments must be consistent with Code philosophy, and such judgments must never be used to overrule mandatory requirements or specific prohibitions of the Code.

The Committee recognizes that tools and techniques used for design and analysis change as technology progresses and expects engineers to use good judgment in the application of these tools. The designer is responsible for complying with Code rules and demonstrating compliance with Code equations when such equations are mandatory. The Code neither requires nor prohibits the use of computers for the design or analysis of components constructed to the requirements of the Code. However, designers and engineers using computer programs for design or analysis are cautioned that they are responsible for all technical assumptions inherent in the programs they use and the application of these programs to their design.

^{*} *Construction*, as used in this Foreword, is an all-inclusive term comprising materials, design, fabrication, examination, inspection, testing, certification, and pressure relief.

The rules established by the Committee are not to be interpreted as approving, recommending, or endorsing any proprietary or specific design, or as limiting in any way the manufacturer's freedom to choose any method of design or any form of construction that conforms to the Code rules.

The Committee meets regularly to consider revisions of the rules, new rules as dictated by technological development, Code Cases, and requests for interpretations. Only the Committee has the authority to provide official interpretations of this Code. Requests for revisions, new rules, Code Cases, or interpretations shall be addressed to the Secretary in writing and shall give full particulars in order to receive consideration and action (see Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees). Proposed revisions to the Code resulting from inquiries will be presented to the Committee for appropriate action. The action of the Committee becomes effective only after confirmation by ballot of the Committee and approval by ASME. Proposed revisions to the Code approved by the Committee are submitted to the American National Standards Institute (ANSI) and published at <http://cstools.asme.org/csconnect/public/index.cfm?PublicReview=Revisions> to invite comments from all interested persons. After public review and final approval by ASME, revisions are published at regular intervals in Editions of the Code.

The Committee does not rule on whether a component shall or shall not be constructed to the provisions of the Code. The scope of each Section has been established to identify the components and parameters considered by the Committee in formulating the Code rules.

Questions or issues regarding compliance of a specific component with the Code rules are to be directed to the ASME Certificate Holder (Manufacturer). Inquiries concerning the interpretation of the Code are to be directed to the Committee. ASME is to be notified should questions arise concerning improper use of an ASME Certification Mark.

When required by context in this Section, the singular shall be interpreted as the plural, and vice versa, and the feminine, masculine, or neuter gender shall be treated as such other gender as appropriate.

STATEMENT OF POLICY ON THE USE OF THE CERTIFICATION MARK AND CODE AUTHORIZATION IN ADVERTISING

ASME has established procedures to authorize qualified organizations to perform various activities in accordance with the requirements of the ASME Boiler and Pressure Vessel Code. It is the aim of the Society to provide recognition of organizations so authorized. An organization holding authorization to perform various activities in accordance with the requirements of the Code may state this capability in its advertising literature.

Organizations that are authorized to use the Certification Mark for marking items or constructions that have been constructed and inspected in compliance with the ASME Boiler and Pressure Vessel Code are issued Certificates of Authorization. It is the aim of the Society to maintain the standing of the Certification Mark for the benefit of the users, the enforcement jurisdictions, and the holders of the Certification Mark who comply with all requirements.

Based on these objectives, the following policy has been established on the usage in advertising of facsimiles of the Certification Mark, Certificates of Authorization, and reference to Code construction. The American Society of Mechanical Engineers does not “approve,” “certify,” “rate,” or “endorse” any item, construction, or activity and there shall be no statements or implications that might so indicate. An organization holding the Certification Mark and/or a Certificate of Authorization may state in advertising literature that items, constructions, or activities “are built (produced or performed) or activities conducted in accordance with the requirements of the ASME Boiler and Pressure Vessel Code,” or “meet the requirements of the ASME Boiler and Pressure Vessel Code.” An ASME corporate logo shall not be used by any organization other than ASME.

The Certification Mark shall be used only for stamping and nameplates as specifically provided in the Code. However, facsimiles may be used for the purpose of fostering the use of such construction. Such usage may be by an association or a society, or by a holder of the Certification Mark who may also use the facsimile in advertising to show that clearly specified items will carry the Certification Mark. General usage is permitted only when all of a manufacturer’s items are constructed under the rules.

STATEMENT OF POLICY ON THE USE OF ASME MARKING TO IDENTIFY MANUFACTURED ITEMS

The ASME Boiler and Pressure Vessel Code provides rules for the construction of boilers, pressure vessels, and nuclear components. This includes requirements for materials, design, fabrication, examination, inspection, and stamping. Items constructed in accordance with all of the applicable rules of the Code are identified with the official Certification Mark described in the governing Section of the Code.

Markings such as “ASME,” “ASME Standard,” or any other marking including “ASME” or the Certification Mark shall not be used on any item that is not constructed in accordance with all of the applicable requirements of the Code.

Items shall not be described on ASME Data Report Forms nor on similar forms referring to ASME that tend to imply that all Code requirements have been met when, in fact, they have not been. Data Report Forms covering items not fully complying with ASME requirements should not refer to ASME or they should clearly identify all exceptions to the ASME requirements.

(13) SUBMITTAL OF TECHNICAL INQUIRIES TO THE BOILER AND PRESSURE VESSEL STANDARDS COMMITTEES

1 INTRODUCTION

(a) The following information provides guidance to Code users for submitting technical inquiries to the committees. See Guideline on the Approval of New Materials Under the ASME Boiler and Pressure Vessel Code in Section II, Parts C and D for additional requirements for requests involving adding new materials to the Code. Technical inquiries include requests for revisions or additions to the Code rules, requests for Code Cases, and requests for Code Interpretations, as described below.

(1) *Code Revisions.* Code revisions are considered to accommodate technological developments, address administrative requirements, incorporate Code Cases, or to clarify Code intent.

(2) *Code Cases.* Code Cases represent alternatives or additions to existing Code rules. Code Cases are written as a question and reply, and are usually intended to be incorporated into the Code at a later date. When used, Code Cases prescribe mandatory requirements in the same sense as the text of the Code. However, users are cautioned that not all jurisdictions or owners automatically accept Code Cases. The most common applications for Code Cases are:

(-a) to permit early implementation of an approved Code revision based on an urgent need

(-b) to permit the use of a new material for Code construction

(-c) to gain experience with new materials or alternative rules prior to incorporation directly into the Code

(3) *Code Interpretations.* Code Interpretations provide clarification of the meaning of existing rules in the Code, and are also presented in question and reply format. Interpretations do not introduce new requirements. In cases where existing Code text does not fully convey the meaning that was intended, and revision of the rules is required to support an interpretation, an Intent Interpretation will be issued and the Code will be revised.

(b) The Code rules, Code Cases, and Code Interpretations established by the committees are not to be considered as approving, recommending, certifying, or endorsing any proprietary or specific design, or as limiting in any way the freedom of manufacturers, constructors, or owners to choose any method of design or any form of construction that conforms to the Code rules.

(c) Inquiries that do not comply with these provisions or that do not provide sufficient information for a committee's full understanding may result in the request being returned to the inquirer with no action.

2 INQUIRY FORMAT

Submittals to a committee shall include:

(a) *Purpose.* Specify one of the following:

(1) revision of present Code rules

(2) new or additional Code rules

(3) Code Case

(4) Code Interpretation

(b) *Background.* Provide the information needed for the committee's understanding of the inquiry, being sure to include reference to the applicable Code Section, Division, Edition, Addenda (if applicable), paragraphs, figures, and tables. Preferably, provide a copy of the specific referenced portions of the Code.

(c) *Presentations.* The inquirer may desire or be asked to attend a meeting of the committee to make a formal presentation or to answer questions from the committee members with regard to the inquiry. Attendance at a committee meeting shall be at the expense of the inquirer. The inquirer's attendance or lack of attendance at a meeting shall not be a basis for acceptance or rejection of the inquiry by the committee.