

**SECTION VI**

**2017**

ASME Boiler and  
Pressure Vessel Code  
An International Code

**Recommended Rules for  
the Care and Operation  
of Heating Boilers**

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AN INTERNATIONAL CODE

# 2017 ASME Boiler & Pressure Vessel Code

2017 Edition

July 1, 2017

# VI

## RECOMMENDED RULES FOR THE CARE AND OPERATION OF HEATING BOILERS

ASME Boiler and Pressure Vessel Committee  
on Heating Boilers



The American Society of  
Mechanical Engineers

Two Park Avenue • New York, NY • 10016 USA

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# CONTENTS

List of Sections .....	vi
Foreword .....	viii
Statement of Policy on the Use of the Certification Mark and Code Authorization in Advertising .....	x
Statement of Policy on the Use of ASME Marking to Identify Manufactured Items .....	x
Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees .....	xi
Personnel .....	xiv
Summary of Changes .....	xxxiii
List of Changes in Record Number Order .....	xxxiv
Cross-Referencing and Stylistic Changes in the Boiler and Pressure Vessel Code .....	xxxv
<b>Article 1 Introduction</b> .....	<b>1</b>
<b>Article 2 Glossary</b> .....	<b>2</b>
<b>Article 3 Types of Boilers</b> .....	<b>6</b>
3.1 Classification .....	6
3.2 ASME Certification Mark .....	6
3.3 Method of Manufacture .....	6
3.4 Category .....	7
<b>Article 4 Fuels and Fuel-Burning Equipment</b> .....	<b>10</b>
4.1 Types of Fuels .....	10
4.2 Fuel-Burning Equipment .....	12
<b>Article 5 Boiler Room Facilities and Installation</b> .....	<b>14</b>
5.1 General .....	14
5.2 Lighting .....	14
5.3 Ventilation and Combustion Air .....	14
5.4 Clearances .....	15
5.5 Fire Protection .....	15
5.6 Electrical Supply .....	15
5.7 Fuel Supply .....	15
5.8 Chimney or Vent .....	15
5.9 Piping — Water and Drain Connections .....	15
5.10 Safety .....	23
5.11 Housekeeping .....	23
5.12 Posting of Certificates and/or Licenses .....	23
5.13 Record Keeping, Logs, Etc. ....	23
<b>Article 6 Overpressure Protection</b> .....	<b>25</b>
6.1 Pressure Relief Valves .....	25
6.2 Pressure Relief Valve Requirements .....	25
6.3 Mounting .....	26

6.4	Pressure Relief Valve Discharge Piping . . . . .	27
6.5	Temperature and Pressure Safety Relief Valves . . . . .	27
6.6	Valve Replacement . . . . .	27
6.7	Try-Lever Test for Safety Valves (Steam Boilers) . . . . .	27
6.8	Try-Lever Test for Safety Relief Valves (Water Boilers) . . . . .	29
<b>Article 7</b>	<b>System Accessories . . . . .</b>	<b>30</b>
7.1	Steam Boilers . . . . .	30
7.2	Hot Water Boilers . . . . .	30
<b>Article 8</b>	<b>Controls and Instrumentation . . . . .</b>	<b>33</b>
8.1	Low-Water Fuel Cutoffs and Water Feeders . . . . .	33
8.2	Pressure Gauge . . . . .	35
8.3	Controls . . . . .	35
8.4	Steam Heating Boilers . . . . .	36
8.5	Hot Water Heating Boilers . . . . .	37
<b>Article 9</b>	<b>Operation and Maintenance of Steam Boilers . . . . .</b>	<b>39</b>
9.1	Starting a New Boiler and Heating System . . . . .	39
9.2	Starting a Boiler After Layup (Single-Boiler Installation) . . . . .	40
9.3	Condensation . . . . .	40
9.4	Cutting in an Additional Boiler . . . . .	40
9.5	Operation . . . . .	41
9.6	Removal of Boiler From Service . . . . .	42
9.7	Maintenance . . . . .	42
<b>Article 10</b>	<b>Operation and Maintenance — Hot Water Boilers and Hot Water Heating Boilers . . . . .</b>	<b>45</b>
10.1	Starting a New Boiler and Heating System . . . . .	45
10.2	Starting a Boiler After Layup (Single-Boiler Installation) . . . . .	45
10.3	Condensation . . . . .	46
10.4	Cutting in an Additional Boiler . . . . .	46
10.5	Operation . . . . .	46
10.6	Removal of Boiler From Service . . . . .	46
10.7	Maintenance . . . . .	47
<b>Article 11</b>	<b>Inspections of Installed Boilers . . . . .</b>	<b>50</b>
11.1	Periodic Inspection of Boilers . . . . .	50
11.2	Inspection of the Boiler by the Inspector . . . . .	50
<b>Article 12</b>	<b>Boiler Repairs . . . . .</b>	<b>51</b>
12.1	Precaution . . . . .	51
12.2	Notification . . . . .	51
12.3	Welding Requirements . . . . .	51
12.4	Safety . . . . .	51
<b>Article 13</b>	<b>Water Treatment . . . . .</b>	<b>52</b>
13.1	Scope . . . . .	52
13.2	Considerations . . . . .	52
13.3	Water Treatment Specialists . . . . .	52
13.4	Local Ordinances . . . . .	52
13.5	Potential Boiler Water Problems . . . . .	52
13.6	Blowdown (Steam Boilers) . . . . .	53

13.7	Chemical Feeders . . . . .	53
13.8	Procedures . . . . .	53
<b>Article 14</b>	<b>Treatment of Laid-Up Boilers . . . . .</b>	<b>54</b>
14.1	General . . . . .	54
14.2	Dry Method . . . . .	54
14.3	Wet Method . . . . .	54
 <b>Mandatory Appendix I Periodic Testing and Maintenance . . . . .</b>		<b>55</b>
I-1	Inspection and Maintenance Program . . . . .	55
I-2	Responsibilities of Personnel . . . . .	55
 <b>Figures</b>		
3.3.1.1.1-1	Horizontal Tube, Brick-Set . . . . .	7
3.3.1.1.2-1	Gas Flow Patterns of Scotch-Type Boilers . . . . .	8
3.3.1.1.3-1	Type C Firebox Boiler . . . . .	8
3.3.1.1.3-2	Three-Pass Firebox Boiler . . . . .	9
3.3.1.1.4-1	Vertical Firetube Boiler . . . . .	9
3.3.2.1-1	Horizontal Sectional Cast Iron Boiler . . . . .	9
3.3.2.1-2	Vertical Sectional Cast Iron Boiler . . . . .	9
5.9.1-1	Single Hot Water Heating Boiler — Acceptable Piping Installation . . . . .	16
5.9.1-2	Hot Water Heating Boilers in Battery — Acceptable Piping Installation . . . . .	17
5.9.1-3	Single Steam Boilers — Acceptable Piping Installation . . . . .	18
5.9.1-4	Steam Boilers in Battery — Pumped Return — Acceptable Piping Installation . . . . .	19
5.9.1-5	Steam Boilers in Battery — Gravity Return — Acceptable Piping Installation . . . . .	20
5.9.8-1	Modules Connected With Parallel Piping . . . . .	23
5.9.8-2	Modules Connected With Primary–Secondary Piping . . . . .	23
6.1.1-1	Official Certification Mark . . . . .	25
6.1.2-1	Safety Valve . . . . .	26
6.1.3-1	Safety Relief Valve . . . . .	26
6.4.1-1	Safety Relief Valve Discharge Pipe . . . . .	28
7.1.1-1	Thermostatic Trap . . . . .	30
7.1.1-2	Float Trap . . . . .	31
7.1.1-3	Float and Thermostatic Trap . . . . .	31
7.1.1-4	Bucket Trap With Trap Closed . . . . .	31
7.1.2.3-1	Typical Return Loop . . . . .	32
8.1.1-1	Float-Type Low-Water Cutoff . . . . .	33
8.1.2-1	Probe-Type Low-Water Cutoff . . . . .	34
I-1-1	Exhibit A . . . . .	56
I-1-2	Exhibit B . . . . .	58
 <b>Table</b>		
5.9.5-1	Size of Bottom Blowoff Piping, Valves, and Cocks . . . . .	22

(17)

## 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<sup>\*</sup>
    - 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
  - Division 2 — Code for Concrete Containments
  - Division 3 — Containment Systems for Transportation and Storage of Spent Nuclear Fuel and High-Level Radioactive Material
  - 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, Brazing, and Fusing 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

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<sup>\*</sup> The 2015 Edition of Section III was the last edition in which Section III, Division 1, Subsection NH, *Class 1 Components in Elevated Temperature Service*, was published. The requirements located within Subsection NH were moved to Section III, Division 5, Subsection HB, Subpart B for the elevated temperature construction of Class A components.

## **INTERPRETATIONS**

Interpretations are issued in real time in ASME's Interpretations Database at <http://go.asme.org/Interpretations>. Historical BPVC interpretations may also be found in the Database.

## **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 2017 Code Cases book: "Boilers and Pressure Vessels" or "Nuclear Components." Supplements will be sent or made available automatically to the purchasers of the Code Cases books up to the publication of the 2019 Code.

# FOREWORD\*

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, Brazing, and Fusing (IX)
- (h) Committee on Fiber-Reinforced Plastic Pressure Vessels (X)
- (i) Committee on Nuclear Inservice Inspection (XI)
- (j) Committee on Transport Tanks (XII)
- (k) Technical Oversight Management Committee (TOMC)

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. The technical consistency of the Sections of the Code and coordination of standards development activities of the Committees is supported and guided by the Technical Oversight Management Committee. 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 judgment* 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

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\* The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI’s requirements for an ANS. Therefore, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Code.

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

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.

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://go.asme.org/BPVCPublicReview> 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.

# SUBMITTAL OF TECHNICAL INQUIRIES TO THE BOILER AND PRESSURE VESSEL STANDARDS COMMITTEES (17)

## 1 INTRODUCTION

(a) The following information provides guidance to Code users for submitting technical inquiries to the applicable Boiler and Pressure Vessel (BPV) Standards Committee (hereinafter referred to as the Committee). See the guidelines on approval of new materials under the ASME Boiler and Pressure Vessel Code in Section II, Part D for requirements for requests that involve adding new materials to the Code. See the guidelines on approval of new welding and brazing materials in Section II, Part C for requirements for requests that involve adding new welding and brazing materials (“consumables”) to the Code.

Technical inquiries can include requests for revisions or additions to the Code requirements, requests for Code Cases, or requests for Code Interpretations, as described below:

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

(2) *Code Cases.* Code Cases represent alternatives or additions to existing Code requirements. 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 regulators, jurisdictions, or Owners automatically accept Code Cases. The most common applications for Code Cases are as follows:

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

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

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

(3) *Code Interpretations*

(-a) Code Interpretations provide clarification of the meaning of existing requirements in the Code and are presented in Inquiry and Reply format. Interpretations do not introduce new requirements.

(-b) If existing Code text does not fully convey the meaning that was intended, or conveys conflicting requirements, and revision of the requirements is required to support the Interpretation, an Intent Interpretation will be issued in parallel with a revision to the Code.

(b) Code requirements, Code Cases, and Code Interpretations established by the Committee 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 requirements.

(c) Inquiries that do not comply with the following guidance or that do not provide sufficient information for the Committee’s full understanding may result in the request being returned to the Inquirer with no action.

## 2 INQUIRY FORMAT

Submittals to the Committee should include the following information:

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

(1) request for revision of present Code requirements

(2) request for new or additional Code requirements

(3) request for Code Case

(4) request for Code Interpretation

(b) *Background.* The Inquirer should 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, the Inquirer should provide a copy of, or relevant extracts from, the specific referenced portions of the Code.

(c) *Presentations.* The Inquirer may desire to attend 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 BPV Standards Committee meeting shall be at the expense of the Inquirer. The Inquirer's attendance or lack of attendance at a meeting will not be used by the Committee as a basis for acceptance or rejection of the Inquiry by the Committee. However, if the Inquirer's request is unclear, attendance by the Inquirer or a representative may be necessary for the Committee to understand the request sufficiently to be able to provide an Interpretation. If the Inquirer desires to make a presentation at a Committee meeting, the Inquirer should provide advance notice to the Committee Secretary, to ensure time will be allotted for the presentation in the meeting agenda. The Inquirer should consider the need for additional audiovisual equipment that might not otherwise be provided by the Committee. With sufficient advance notice to the Committee Secretary, such equipment may be made available.

### 3 CODE REVISIONS OR ADDITIONS

Requests for Code revisions or additions should include the following information:

(a) *Requested Revisions or Additions.* For requested revisions, the Inquirer should identify those requirements of the Code that they believe should be revised, and should submit a copy of, or relevant extracts from, the appropriate requirements as they appear in the Code, marked up with the requested revision. For requested additions to the Code, the Inquirer should provide the recommended wording and should clearly indicate where they believe the additions should be located in the Code requirements.

(b) *Statement of Need.* The Inquirer should provide a brief explanation of the need for the revision or addition.

(c) *Background Information.* The Inquirer should provide background information to support the revision or addition, including any data or changes in technology that form the basis for the request, that will allow the Committee to adequately evaluate the requested revision or addition. Sketches, tables, figures, and graphs should be submitted, as appropriate. The Inquirer should identify any pertinent portions of the Code that would be affected by the revision or addition and any portions of the Code that reference the requested revised or added paragraphs.

### 4 CODE CASES

Requests for Code Cases should be accompanied by a statement of need and background information similar to that described in 3(b) and 3(c), respectively, for Code revisions or additions. The urgency of the Code Case (e.g., project underway or imminent, new procedure) should be described. In addition, it is important that the request is in connection with equipment that will bear the Certification Mark, with the exception of Section XI applications. The proposed Code Case should identify the Code Section and Division, and should be written as a Question and a Reply, in the same format as existing Code Cases. Requests for Code Cases should also indicate the applicable Code Editions and Addenda (if applicable) to which the requested Code Case applies.

### 5 CODE INTERPRETATIONS

(a) Requests for Code Interpretations should be accompanied by the following information:

(1) *Inquiry.* The Inquirer should propose a condensed and precise Inquiry, omitting superfluous background information and, when possible, composing the Inquiry in such a way that a "yes" or a "no" Reply, with brief limitations or conditions, if needed, can be provided by the Committee. The proposed question should be technically and editorially correct.

(2) *Reply.* The Inquirer should propose a Reply that clearly and concisely answers the proposed Inquiry question. Preferably, the Reply should be "yes" or "no," with brief limitations or conditions, if needed.

(3) *Background Information.* The Inquirer should provide any need or background information, such as described in 3(b) and 3(c), respectively, for Code revisions or additions, that will assist the Committee in understanding the proposed Inquiry and Reply.

If the Inquirer believes a revision of the Code requirements would be helpful to support the Interpretation, the Inquirer may propose such a revision for consideration by the Committee. In most cases, such a proposal is not necessary.

(b) Requests for Code Interpretations should be limited to an Interpretation of a particular requirement in the Code or in a Code Case. Except with regard to interpreting a specific Code requirement, the Committee is not permitted to consider consulting-type requests such as the following:

(1) a review of calculations, design drawings, welding qualifications, or descriptions of equipment or parts to determine compliance with Code requirements

- (2) a request for assistance in performing any Code-prescribed functions relating to, but not limited to, material selection, designs, calculations, fabrication, inspection, pressure testing, or installation
- (3) a request seeking the rationale for Code requirements

## 6 SUBMITTALS

(a) *Submittal.* Requests for Code Interpretation should preferably be submitted through the online Interpretation Submittal Form. The form is accessible at <http://go.asme.org/InterpretationRequest>. Upon submittal of the form, the Inquirer will receive an automatic e-mail confirming receipt. If the Inquirer is unable to use the online form, the Inquirer may mail the request to the following address:

Secretary  
ASME Boiler and Pressure Vessel Committee  
Two Park Avenue  
New York, NY 10016-5990

All other Inquiries should be mailed to the Secretary of the BPV Committee at the address above. Inquiries are unlikely to receive a response if they are not written in clear, legible English. They must also include the name of the Inquirer and the company they represent or are employed by, if applicable, and the Inquirer's address, telephone number, fax number, and e-mail address, if available.

(b) *Response.* The Secretary of the appropriate Committee will provide a written response, via letter or e-mail, as appropriate, to the Inquirer, upon completion of the requested action by the Committee. Inquirers may track the status of their Interpretation Request at <http://go.asme.org/Interpretations>.

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B. J. Iske	S. V. Voorhees, <i>Contributing Member</i>
J. Klug	J. L. Kleiss, <i>Alternate</i>
P. A. Molvie	

**Subgroup on Care and Operation of Heating Boilers (BPV IV)**

M. Wadkinson, <i>Chair</i>	J. A. Hall
T. L. Bedeaux	P. A. Molvie
J. Calland	C. Lasarte, <i>Contributing Member</i>
J. M. Downs	

**Subgroup on Cast Boilers (BPV IV)**

J. P. Chicoine, <i>Chair</i>	J. A. Hall
T. L. Bedeaux, <i>Vice Chair</i>	J. L. Kleiss
J. M. Downs	

**Subgroup on Materials (BPV IV)**

M. Wadkinson, <i>Chair</i>	J. A. Hall
J. Calland	A. Heino
J. M. Downs	B. J. Iske

**Subgroup on Water Heaters (BPV IV)**

J. Calland, <i>Chair</i>	R. E. Olson
L. Badziagowski	M. A. Taylor
J. P. Chicoine	T. E. Trant
C. Dinic	R. D. Troutt
B. J. Iske	

**Subgroup on Welded Boilers (BPV IV)**

P. A. Molvie, <i>Chair</i>	J. L. Kleiss
L. Badziagowski	R. E. Olson
T. L. Bedeaux	G. Scribner
B. Calderon	R. D. Troutt
J. Calland	M. Wadkinson
C. Dinic	R. V. Wielgoszinski

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S. J. Akrin	T. L. Plasek
J. E. Batey	F. J. Sattler
P. L. Brown	P. B. Shaw
M. A. Burns	G. M. Gatti, <i>Delegate</i>
B. Caccamise	X. Guiping, <i>Delegate</i>
C. Emslander	A. S. Birks, <i>Contributing Member</i>
N. Y. Faransso	J. Bennett, <i>Alternate</i>
N. A. Finney	H. C. Graber, <i>Honorary Member</i>
A. F. Garbolevsky	O. F. Hedden, <i>Honorary Member</i>
J. F. Halley	J. R. MacKay, <i>Honorary Member</i>
J. W. Houf	T. G. McCarty, <i>Honorary Member</i>
S. A. Johnson	

**Executive Committee (BPV V)**

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G. W. Hembree, <i>Vice Chair</i>	N. A. Finney
J. S. Brzuszkiewicz, <i>Staff Secretary</i>	S. A. Johnson
J. E. Batey	A. B. Nagel
B. Caccamise	

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S. J. Akrin	D. I. Morris
J. E. Batey	A. B. Nagel
N. Carter	A. S. Birks, <i>Contributing Member</i>
N. Y. Faransso	J. P. Swezy, Jr., <i>Contributing Member</i>
N. A. Finney	
G. W. Hembree	

**Special Working Group on NDE Resource Support (SG-GR/PQ & I)  
(BPV V)**

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D. Adkins	C. Magruder
J. Anderson	J. W. Mefford, Jr.
D. Bajula	K. Page
J. Bennett	D. Tompkins
C. T. Brown	D. Van Allen
T. Clausing	T. Vidimos
J. L. Garner	R. Ward
K. Hayes	M. Wolf

**Subgroup on Surface Examination Methods (BPV V)**

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S. J. Akrin	B. D. Laite
J. E. Batey	C. May
P. L. Brown	L. E. Mullins
B. Caccamise	A. B. Nagel
N. Carter	F. J. Sattler
N. Y. Faransso	P. B. Shaw
N. Farenbaugh	G. M. Gatti, <i>Delegate</i>
N. A. Finney	A. S. Birks, <i>Contributing Member</i>

**Subgroup on Volumetric Methods (BPV V)**

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J. E. Batey	R. W. Kruzic
P. L. Brown	C. May
B. Caccamise	L. E. Mullins
J. M. Davis	T. L. Plasek
N. Y. Faransso	F. J. Sattler
A. F. Garbolevsky	C. Vorwald
J. F. Halley	G. M. Gatti, <i>Delegate</i>
R. W. Hardy	

**Working Group on Acoustic Emissions (SG-VM) (BPV V)**

N. Y. Faransso, <i>Chair</i>	S. R. Doctor
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**Working Group on Radiography (SG-VM) (BPV V)**

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J. E. Batey	B. D. Laite
P. L. Brown	C. May
C. Emslander	R. J. Mills
N. Y. Faransso	A. B. Nagel
A. F. Garbolevsky	T. L. Plasek
R. W. Hardy	B. White

**Working Group on Ultrasonics (SG-VM) (BPV V)**

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J. M. Davis	L. E. Mullins
C. Emslander	A. B. Nagel
N. Y. Faransso	F. J. Sattler
P. T. Hayes	C. Vorwald
S. A. Johnson	

**Working Group on Guided Wave Ultrasonic Testing (SG-VM) (BPV V)**

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**Italy International Working Group (BPV V)**

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R. Bertolotti	O. Oldani
F. Bresciani	P. Pedersoli
G. Campos	A. Tintori
N. Caputo	M. Zambon
M. Colombo	G. Gobbi, <i>Contributing Member</i>
F. Ferrarese	G. Pontiggia, <i>Contributing Member</i>
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J. Cameron	D. B. Stewart
A. Chaudouet	D. A. Swanson
D. B. DeMichael	J. P. Swezy, Jr.
J. P. Glaspie	S. Terada
J. F. Grubb	E. Uptis
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K. T. Lau	K. Oyamada, <i>Delegate</i>
M. D. Lower	M. E. Papponetti, <i>Delegate</i>
R. Mahadeen	X. Tang, <i>Delegate</i>
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U. R. Miller	W. S. Jacobs, <i>Contributing Member</i>
B. R. Morelock	K. Mokhtarian, <i>Contributing Member</i>
T. P. Pastor	
D. T. Peters	
M. J. Pischke	C. C. Neely, <i>Contributing Member</i>
M. D. Rana	K. K. Tam, <i>Honorary Member</i>

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S. R. Babka	T. G. Seipp
O. A. Barsky	D. Srnica
R. J. Basile	S. Terada
M. R. Breach	J. Vattappilly
F. L. Brown	R. A. Whipple
D. Chandiramani	K. Xu
B. F. Hantz	K. Oyamada, <i>Delegate</i>
C. E. Hinnant	M. E. Papponetti, <i>Delegate</i>
C. S. Hinson	W. S. Jacobs, <i>Contributing Member</i>
M. H. Jawad	P. K. Lam, <i>Contributing Member</i>
D. L. Kurle	K. Mokhtarian, <i>Contributing Member</i>
M. D. Lower	
R. W. Mikitka	
U. R. Miller	S. C. Shah, <i>Contributing Member</i>
T. P. Pastor	K. K. Tam, <i>Contributing Member</i>

**Working Group on Design-By-Analysis (BPV VIII)**

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T. W. Norton, <i>Secretary</i>	A. Mann
R. G. Brown	G. A. Miller
D. Dewees	C. Nadarajah
R. D. Dixon	P. Prueter
Z. Gu	M. D. Rana
C. F. Heberling II	T. G. Seipp
C. E. Hinnant	M. A. Shah
R. Jain	S. Terada
M. H. Jawad	D. Arnett, <i>Contributing Member</i>

**Task Group on U-2(g) (BPV VIII)**

G. Auriolles, Sr.	R. F. Reedy, Sr.
S. R. Babka	S. C. Roberts
R. J. Basile	M. A. Shah
D. K. Chandiramani	D. Srnicek
R. Mahadeen	D. A. Swanson
U. R. Miller	J. P. Swezy, Jr.
T. W. Norton	R. Uebel
T. P. Pastor	K. K. Tam, <i>Contributing Member</i>

**Subgroup on Fabrication and Examination (BPV VIII)**

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E. A. Whittle, <i>Vice Chair</i>	E. Uptis
B. R. Morelock, <i>Secretary</i>	K. Oyamada, <i>Delegate</i>
N. Carter	W. J. Bees, <i>Contributing Member</i>
S. Flynn	L. F. Campbell, <i>Contributing Member</i>
S. Heater	W. S. Jacobs, <i>Contributing Member</i>
O. Mulet	J. Lee, <i>Contributing Member</i>
M. J. Pischke	R. Uebel, <i>Contributing Member</i>
M. J. Rice	
C. D. Rodery	

**Subgroup on Heat Transfer Equipment (BPV VIII)**

G. Auriolles, Sr., <i>Chair</i>	U. R. Miller
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P. Matkovic, <i>Secretary</i>	A. M. Voytko
D. Angstadt	R. P. Wiberg
M. Bahadori	I. G. Campbell, <i>Contributing Member</i>
J. H. Barbee	I. Garcia, <i>Contributing Member</i>
O. A. Barsky	J. Mauritz, <i>Contributing Member</i>
L. Bower	T. W. Norton, <i>Contributing Member</i>
A. Chaudouet	F. Osweiller, <i>Contributing Member</i>
M. D. Clark	J. Pasek, <i>Contributing Member</i>
S. Jeyakumar	R. Tiwari, <i>Contributing Member</i>
G. G. Karcher	S. Yokell, <i>Contributing Member</i>
D. L. Kurle	S. M. Caldwell, <i>Honorary Member</i>
R. Mahadeen	
S. Mayeux	

**Subgroup on General Requirements (BPV VIII)**

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J. P. Glaspie, <i>Vice Chair</i>	T. P. Pastor
F. L. Richter, <i>Secretary</i>	S. C. Roberts
R. J. Basile	J. C. Sowinski
D. T. Davis	P. Speranza
D. B. DeMichael	D. B. Stewart
M. Faulkner	D. A. Swanson
F. Hamtak	R. Uebel
L. E. Hayden, Jr.	C. C. Neely, <i>Contributing Member</i>

**Task Group on Plate Heat Exchangers (BPV VIII)**

P. Matkovic, <i>Chair</i>	R. Mahadeen
S. R. Babka	D. I. Morris
K. Devlin	M. J. Pischke
S. Flynn	C. M. Romero
J. F. Grubb	E. Soltow
F. Hamtak	D. Srnicek

**Task Group on Subsea Applications (BPV VIII)**

R. Cordes, <i>Chair</i>	F. Kirkemo
L. P. Antalffy	C. Lan
R. C. Biel	N. McKie
P. Bunch	S. K. Parimi
J. Ellens	M. Sarzynski
S. Harbert	Y. Wada
X. Kaculi	D. T. Peters, <i>Contributing Member</i>
K. Karpanan	

**Subgroup on High Pressure Vessels (BPV VIII)**

D. T. Peters, <i>Chair</i>	E. A. Rodriguez
G. M. Mital, <i>Vice Chair</i>	E. D. Roll
A. P. Maslowski, <i>Staff Secretary</i>	K. C. Simpson, Jr.
L. P. Antalffy	J. R. Sims
R. C. Biel	D. L. Stang
P. N. Chaku	F. W. Tatar
R. Cordes	S. Terada
R. D. Dixon	J. L. Traud
L. Fridlund	R. Wink
R. T. Hallman	K.-J. Young
A. H. Honza	R. M. Hoshman, <i>Contributing Member</i>
J. A. Kapp	D. J. Burns, <i>Honorary Member</i>
J. Keltjens	D. M. Fryer, <i>Honorary Member</i>
A. K. Khare	G. J. Mraz, <i>Honorary Member</i>
N. McKie	E. H. Perez, <i>Honorary Member</i>
S. C. Mordre	
G. T. Nelson	

**Task Group on UG-20(f) (BPV VIII)**

S. Krishnamurthy, <i>Chair</i>	B. R. Macejko
T. Anderson	J. Penso
K. Bagnoli	M. Prager
R. P. Deubler	M. D. Rana
B. F. Hantz	

**Subgroup on Materials (BPV VIII)**

J. Cameron, <i>Chair</i>	D. W. Rahoi
P. G. Wittenbach, <i>Vice Chair</i>	R. C. Sutherland
K. Xu, <i>Secretary</i>	E. Upitis
A. Di Rienzo	G. S. Dixit, <i>Contributing Member</i>
J. D. Fritz	M. Gold, <i>Contributing Member</i>
J. F. Grubb	M. Katcher, <i>Contributing Member</i>
M. Kowalczyk	J. A. McMaster, <i>Contributing Member</i>
W. M. Lundy	E. G. Nisbett, <i>Contributing Member</i>
J. Penso	

**Italy International Working Group (BPV VIII)**

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A. Veroni, <i>Secretary</i>	P. Mantovani
B. G. Alborali	M. Massobrio
P. Angelini	L. Moracchioli
R. Boatti	C. Sangaletti
A. Camanni	S. Sarti
P. Conti	A. Teli
P. L. Dinelli	I. Venier
F. Finco	G. Gobbi, <i>Contributing Member</i>

**Subgroup on Toughness (BPV II & BPV VIII)**

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W. S. Jacobs	J. Vattappilly
K. E. Orié	K. Oyamada, <i>Delegate</i>
M. D. Rana	K. Mokhtarian, <i>Contributing Member</i>
F. L. Richter	C. C. Neely, <i>Contributing Member</i>
K. Subramanian	
D. A. Swanson	

**Special Working Group on Bolted Flanged Joints (BPV VIII)**

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W. Brown	G. B. Rawls, Jr.
H. Chen	M. S. Shelton
W. J. Koves	

**Subgroup on Graphite Pressure Equipment (BPV VIII)**

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G. C. Becherer	E. Soltow
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**Working Group on Design (BPV VIII Div. 3)**

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R. C. Biel	K. Subramanian
R. Cordes	S. Terada
R. D. Dixon	J. L. Traud
L. Fridlund	R. Wink
R. T. Hallman	Y. Xu
K. Karpanan	F. Kirkemo, <i>Contributing Member</i>
J. Keltjens	D. J. Burns, <i>Honorary Member</i>
N. McKie	D. M. Fryer, <i>Honorary Member</i>
G. M. Mital	G. J. Mraz, <i>Honorary Member</i>
S. C. Mordre	E. H. Perez, <i>Honorary Member</i>
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D. T. Peters	

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Z. Fan, <i>Secretary</i>	C. Miao
Y. Chen	X. Qian
Z. Chen	B. Wang
J. Cui	F. Xu
R. Duan	F. Xuan
W. Guo	K. Zhang
B. Han	Y. Zhang
J. Hu	S. Zhao
Q. Hu	J. Zheng
H. Hui	G. Zhu

**Working Group on Materials (BPV VIII Div. 3)**

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L. P. Antalffy	A. K. Khare
P. N. Chaku	

**Germany International Working Group (BPV VIII)**

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A. Spangenberg, <i>Vice Chair</i>	S. Krebs
H. P. Schmitz, <i>Secretary</i>	T. Ludwig
B. Daume	R. A. Meyers
A. Emrich	H. Michael
J. Fleischfresser	P. Paluszkiewicz
A. Gastberg	H. Schroeder
R. Helmholdt	M. Sykora
R. Kauer	

**Task Group on Impulsively Loaded Vessels (BPV VIII)**

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J. K. Asahina	F. Ohlson
D. D. Barker	C. Romero
A. M. Clayton	N. Rushton
J. E. Didlake, Jr.	J. H. Stofleth
T. A. Duffey	Q. Dong, <i>Contributing Member</i>
B. L. Haroldsen	H.-P. Schildberg, <i>Contributing Member</i>
K. Hayashi	J. E. Shepherd, <i>Contributing Member</i>
D. Hilding	M. Yip, <i>Contributing Member</i>
K. W. King	
R. Kitamura	

**Subgroup on Interpretations (BPV VIII)**

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E. Lawson, <i>Staff Secretary</i>	D. T. Peters
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R. J. Basile	C. D. Rodery
J. Cameron	D. B. Stewart
R. D. Dixon	P. L. Sturgill
M. Kowalczyk	D. A. Swanson
D. L. Kurle	J. P. Swezy, Jr.
M. D. Lower	J. Vattappilly
R. Mahadeen	P. G. Wittenbach
G. M. Mital	T. P. Pastor, <i>Contributing Member</i>

**Subgroup on Plastic Fusing (BPV IX)**

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D. Burwell	E. G. Reichelt
M. Ghahremani	M. J. Rice
K. L. Hayes	S. Schuessler
R. M. Jessee	M. Troughton
J. Johnston, Jr.	J. Wright

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S. J. Rossi, <i>Staff Secretary</i>	P. L. Sturgill
M. Bernasek	J. P. Swezy, Jr.
M. A. Boring	P. L. Van Fosson
J. G. Feldstein	E. W. Woelfel
P. D. Flenner	A. Roza, <i>Delegate</i>
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K. L. Hayes	S. A. Jones, <i>Contributing Member</i>
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J. S. Lee	S. Raghunathan, <i>Contributing Member</i>
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T. Melfi	M. L. Carpenter, <i>Honorary Member</i>
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M. J. Rice	
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**Subgroup on Welding Qualifications (BPV IX)**

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M. A. Boring	S. A. Sprague
D. A. Bowers	P. L. Sturgill
R. B. Corbit	J. P. Swezy, Jr.
P. D. Flenner	P. L. Van Fosson
L. S. Harbison	T. C. Wiesner
K. L. Hayes	A. D. Wilson
W. M. Lundy	D. Chandiramani, <i>Contributing Member</i>
T. Melfi	M. Consonni, <i>Contributing Member</i>
W. F. Newell, Jr.	M. Degan, <i>Contributing Member</i>
B. R. Newton	
S. Raghunathan	

**Subgroup on Brazing (BPV IX)**

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E. W. Beckman	N. Mohr
L. F. Campbell	A. R. Nywening
M. L. Carpenter	J. P. Swezy, Jr.

**Italy International Working Group (BPV IX)**

A. Camanni, <i>Chair</i>	N. Maestri
A. Veroni, <i>Secretary</i>	M. Mandina
P. Angelini	M. Massobrio
R. Boatti	L. Moracchioli
P. L. Dinelli	G. Pontiggia
F. Ferrarese	S. Verderame
A. Ghidini	A. Volpi
E. Lazzari	G. Gobbi, <i>Contributing Member</i>
L. Lotti	

**Subgroup on General Requirements (BPV IX)**

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J. P. Bell	D. K. Peetz
D. A. Bowers	J. Pillow
G. Chandler	H. B. Porter
P. R. Evans	J. P. Swezy, Jr.
S. Flynn	K. R. Willens
P. Gilston	E. W. Woelfel
F. Hamtak	E. Molina, <i>Delegate</i>
A. Howard	B. R. Newmark, <i>Honorary Member</i>

**Subgroup on Materials (BPV IX)**

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J. L. Arnold	C. E. Sainz
E. Cutlip	W. J. Sperko
S. S. Fiore	M. J. Stanko
S. E. Gingrich	P. L. Sturgill
L. S. Harbison	J. Warren
R. M. Jessee	C. Zanfir
T. Melfi	

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## SUMMARY OF CHANGES

Errata to the BPV Code may be posted on the ASME Web site to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in the BPV Code. Such Errata shall be used on the date posted.

Information regarding Special Notices and Errata is published by ASME at <http://go.asme.org/BPVCerrata>.

The 2017 Edition of BPVC Section VI is a complete rewrite; the 2015 Edition has been revised and reorganized in its entirety (12-1918, 16-2739). Front matter changes given below are identified on the pages by a margin note, **(17)**, placed next to the affected area.

The Record Numbers cited in the previous paragraph and listed below are explained in more detail in “List of Changes in Record Number Order” following this Summary of Changes.

<i>Page</i>	<i>Location</i>	<i>Change (Record Number)</i>
vi	List of Sections	Updated
xi	Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees	Revised in its entirety (13-2222)
xiv	Personnel	Updated

## LIST OF CHANGES IN RECORD NUMBER ORDER

Record Number	Change
12-1918	Revised and updated Section VI in its entirety.
13-2222	Revised front guidance on interpretations in its entirety.
16-2739	Revised 8.5.4.1.

# CROSS-REFERENCING AND STYLISTIC CHANGES IN THE BOILER AND PRESSURE VESSEL CODE

There have been structural and stylistic changes to BPVC, starting with the 2011 Addenda, that should be noted to aid navigating the contents. The following is an overview of the changes:

## Subparagraph Breakdowns/Nested Lists Hierarchy

- First-level breakdowns are designated as (a), (b), (c), etc., as in the past.
- Second-level breakdowns are designated as (1), (2), (3), etc., as in the past.
- Third-level breakdowns are now designated as (-a), (-b), (-c), etc.
- Fourth-level breakdowns are now designated as (-1), (-2), (-3), etc.
- Fifth-level breakdowns are now designated as (+a), (+b), (+c), etc.
- Sixth-level breakdowns are now designated as (+1), (+2), etc.

## Footnotes

With the exception of those included in the front matter (roman-numbered pages), all footnotes are treated as endnotes. The endnotes are referenced in numeric order and appear at the end of each BPVC section/subsection.

## Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees

*Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees* has been moved to the front matter. This information now appears in all Boiler Code Sections (except for Code Case books).

## Cross-References

It is our intention to establish cross-reference link functionality in the current edition and moving forward. To facilitate this, cross-reference style has changed. Cross-references within a subsection or subarticle will not include the designator/identifier of that subsection/subarticle. Examples follow:

- *(Sub-)Paragraph Cross-References.* The cross-references to subparagraph breakdowns will follow the hierarchy of the designators under which the breakdown appears.
  - If subparagraph (-a) appears in X.1(c)(1) and is referenced in X.1(c)(1), it will be referenced as (-a).
  - If subparagraph (-a) appears in X.1(c)(1) but is referenced in X.1(c)(2), it will be referenced as (1)(-a).
  - If subparagraph (-a) appears in X.1(c)(1) but is referenced in X.1(e)(1), it will be referenced as (c)(1)(-a).
  - If subparagraph (-a) appears in X.1(c)(1) but is referenced in X.2(c)(2), it will be referenced as X.1(c)(1)(-a).
- *Equation Cross-References.* The cross-references to equations will follow the same logic. For example, if eq. (1) appears in X.1(a)(1) but is referenced in X.1(b), it will be referenced as eq. (a)(1)(1). If eq. (1) appears in X.1(a)(1) but is referenced in a different subsection/subarticle/paragraph, it will be referenced as eq. X.1(a)(1)(1).

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# ARTICLE 1

## INTRODUCTION

The purpose of these recommended guidelines is to promote safety in the use of steam heating, hot water heating, and hot water supply boilers that are directly fired with oil, gas, electricity, coal, or other solid and liquid fuels. These guidelines are intended for use by those directly responsible for operating and maintaining heating and hot water supply boilers. These guidelines apply only to boilers subject to the service restrictions of Section IV, HG-101 of the ASME Boiler and Pressure Vessel Code, as follows:

(a) steam boilers for operation at pressures not exceeding 15 psi (100 kPa)

(b) hot water heating and hot water supply boilers for operation at pressures not exceeding 160 psi (1 100 kPa) and/or temperatures not exceeding 250°F (120°C)

These guidelines apply to the boiler proper and to pipe connections up to and including the valve or valves as required by the Code. Guidelines are also provided for operation of auxiliary equipment and appliances that affect the safe and reliable operation of heating boilers.

The use of the word “shall” in these Guidelines reflects the mandatory nature of the Section IV requirements. The reader should consult the latest edition of Section IV for the current requirements.

Formulating a set of guidelines that is applicable to all sites and types of installations is difficult; therefore, it may be advisable to depart from these guidelines in specific cases. Manufacturer’s operating instructions should always be adhered to, as should any local jurisdictional requirements. Other industry-accepted codes and standards, such as the National Fire Protection Association’s (NFPA) codes covering prevention of furnace explosions, are recommended for additional guidance.

These guidelines are not intended to be used in lieu of any required inspections and operations mandated by jurisdictions, the National Board Inspection Code, or insurance companies.