ASME BPVC.VIII.3-2021

SECTION VIII

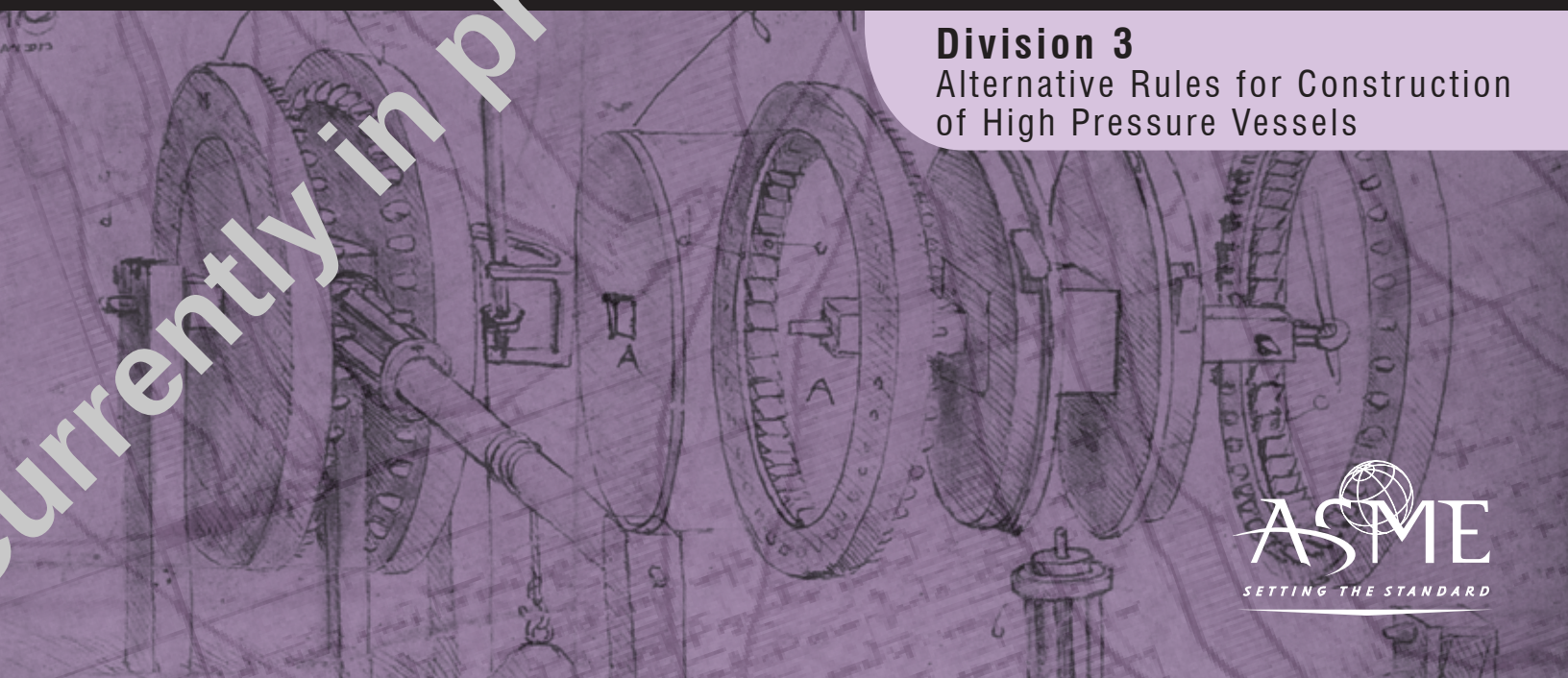
Rules for Construction of Pressure Vessels

2021 ASME Boiler and Pressure Vessel Code

An International Code

Division 3

Alternative Rules for Construction of High Pressure Vessels



ASME

SETTING THE STANDARD

AN INTERNATIONAL CODE

2021 ASME Boiler & Pressure Vessel Code

2021 Edition July 1, 2021

VIII

RULES FOR CONSTRUCTION OF PRESSURE VESSELS

Division 3

Alternative Rules for Construction of High Pressure Vessels

ASME Boiler and Pressure Vessel Committee
on Pressure Vessels

The American Society of Mechanical Engineers

Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: July 1, 2021

This international code or standard was developed under procedures accredited as meeting the criteria for American National Standards and it is an American National Standard. The Standards Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment that provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not “approve," "certify," “rate,” or “endorse” any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor assume any such liability. Users of a code or standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations of this document issued in accordance with the established ASME procedures and policies, which precludes the issuance of interpretations by individuals.

The endnotes and preamble in this document (if any) are part of this American National Standard.

ASME Collective Membership Mark

ASME Single Certification Mark

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 2021.

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

TABLE OF CONTENTS

FIGURES

TABLES

FORMS

LIST OF SECTIONS (21)

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 NCD — Class 2 and 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
- Division 1 — Rules for Inspection and Testing of Components of Light-Water-Cooled Plants
- Division 2 — Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Power Plants

XII Rules for Construction and Continued Service of Transport Tanks

XIII Rules for Overpressure Protection

* In the 2021 Edition, Subsections NC and ND have been incorporated into one publication, Subsection NCD (BPVC.III.1.NCD), Class 2 and Class 3 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 2021 Code Cases book: "Boilers and Pressure Vessels" or "Nuclear Components." Each Code Cases book is updated with seven Supplements. Supplements will be sent or made available automatically to the purchasers of the Code Cases books up to the publication of the 2023 Code. Annulments of Code Cases become effective six months after the first announcement of the annulment in a Code Case Supplement or Edition of the appropriate Code Case book. Code Case users can check the current status of any Code Case at http://go.asme.org/BPVCCDatabase. Code Case users can also view an index of the complete list of Boiler and Pressure Vessel Code Cases and Nuclear Code Cases at http://go.asme.org/BPVCC.

FOREWORD[*]

(21)

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) Committee on Overpressure Protection (XIII)
(l) 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

[*] 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 overpressure protection.

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 the ASME Single 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.

The words "shall," "should," and "may" are used in this Standard as follows:

- *Shall* is used to denote a requirement.
- *Should* is used to denote a recommendation.
- *May* is used to denote permission, neither a requirement nor a recommendation.

STATEMENT OF POLICY ON THE USE OF THE ASME SINGLE 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 ASME Single 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 ASME Single Certification Mark for the benefit of the users, the enforcement jurisdictions, and the holders of the ASME Single 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 ASME Single 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 ASME Single 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 ASME Single 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 ASME Single Certification Mark who may also use the facsimile in advertising to show that clearly specified items will carry the ASME Single Certification Mark.

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 ASME Single Certification Mark described in the governing Section of the Code.

Markings such as "ASME," "ASME Standard," or any other marking including "ASME" or the ASME Single 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.

(21) # 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 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) Interpretations will be issued only if existing Code text is ambiguous or conveys conflicting requirements. If a 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. This information should include a statement indicating why the included paragraphs, figures, or tables are ambiguous or convey conflicting requirements. 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 ASME Single 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 include a statement indicating why the included paragraphs, figures, or tables are ambiguous or convey conflicting requirements. 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.

PERSONNEL
ASME Boiler and Pressure Vessel Standards Committees, Subgroups, and Working Groups

(21)

January 1, 2021

TECHNICAL OVERSIGHT MANAGEMENT COMMITTEE (TOMC)

R. E. McLaughlin, *Chair*
N. A. Finney, *Vice Chair*
S. J. Rossi, *Staff Secretary*
G. Aurioles, Sr.
R. W. Barnes
T. L. Bedeaux
D. A. Bowers
C. Brown
D. B. DeMichael
R. P. Deubler
P. D. Edwards
J. G. Feldstein
G. W. Galanes
J. A. Hall
T. E. Hansen
G. W. Hembree
J. F. Henry
R. B. Keating
B. Linnemann
W. M. Lundy
D. I. Morris
T. P. Pastor
M. D. Rana
S. C. Roberts
F. J. Schaaf, Jr.
G. Scribner
W. J. Sperko
D. Srnic
R. W. Swayne
M. Wadkinson
J. E. Batey, *Contributing Member*

Subgroup on Research and Development (TOMC)

S. C. Roberts, *Chair*
S. J. Rossi, *Staff Secretary*
R. W. Barnes
N. A. Finney
J. F. Henry
W. Hoffelner
B. Hrubala
R. B. Keating
R. E. McLaughlin
T. P. Pastor
D. Andrei, *Contributing Member*

Subgroup on Strategic Initiatives (TOMC)

N. A. Finney, *Chair*
S. J. Rossi, *Staff Secretary*
R. W. Barnes
T. L. Bedeaux
G. W. Hembree
J. F. Henry
M. H. Jawad
R. B. Keating
R. E. McLaughlin
T. P. Pastor
S. C. Roberts

Task Group on Remote Inspection and Examination (SI-TOMC)

S. C. Roberts, *Chair*
P. J. Coco
N. A. Finney
S. A. Marks
R. Rockwood
C. Stevens
M. Tannenbaum
J. Cameron, *Alternate*
P. Lang, *Contributing Member*
J. Pang, *Contributing Member*
S. J. Rossi, *Contributing Member*
C. A. Sanna, *Contributing Member*

Special Working Group on High Temperature Technology (TOMC)

D. Dewees, *Chair*
F. W. Brust
T. D. Burchell
P. R. Donavin
B. F. Hantz
J. F. Henry
R. I. Jetter
P. Smith

ADMINISTRATIVE COMMITTEE

R. E. McLaughlin, *Chair*
N. A. Finney, *Vice Chair*
S. J. Rossi, *Staff Secretary*
D. A. Bowers
J. Cameron
D. B. DeMichael
J. A. Hall
R. B. Keating
B. Linnemann
M. D. Rana
S. C. Roberts
R. R. Stevenson
R. W. Swayne

MARINE CONFERENCE GROUP

E. Lawson, *Staff Secretary*
J. G. Hungerbuhler, Jr.
G. Nair
H. N. Patel
N. Prokopuk
J. D. Reynolds

CONFERENCE COMMITTEE

C. B. Cantrell — Nebraska, *Chair*
J. T. Amato — Ohio, *Secretary*
W. Anderson — Mississippi
P. Bearden — Minnesota
R. Becker — Colorado
T. D. Boggs — Missouri
R. A. Boillard — Indiana
R. J. Bunte — Iowa
J. H. Burpee — Maine
S. Chapman — Tennessee
T. G. Clark — Oregon
B. J. Crawford — Georgia
E. L. Creaser — New Brunswick, Canada
J. J. Dacanay — Hawaii
R. DeLury — Manitoba, Canada
C. Dinic — Ontario, Canada
D. Eastman — Newfoundland and Labrador, Canada
D. A. Ehler — Nova Scotia, Canada
S. D. Frazier — Washington
T. J. Granneman II — Oklahoma
S. Harder — Arizona
E. G. Hilton — Virginia
M. L. Jordan — Kentucky
R. Kamboj — British Columbia, Canada
E. Kawa, Jr. — Massachusetts
A. Khssassi — Quebec, Canada
D. Kinney — North Carolina
J. Klug — City of Milwaukee, Wisconsin
K. S. Lane — Alaska
J. LeSage, Jr. — Louisiana
A. M. Lorimor — South Dakota
M. Mailman — Northwest Territories, Canada
W. McGivney — City of New York, New York
S. F. Noonan — Maryland
A. K. Oda — Washington
B. S. Oliver — New Hampshire
J. L. Oliver — Nevada
M. Poehlmann — Alberta, Canada
P. B. Polick — Illinois
J. F. Porcella — West Virginia
C. F. Reyes — California
W. J. Ross — Pennsylvania
M. J. Ryan — City of Chicago, Illinois
M. H. Sansone — New York
T. S. Seime — North Dakota
C. S. Selinger — Saskatchewan, Canada
J. E. Sharier — Ohio
R. Spiker — North Carolina
D. J. Stenrose — Michigan
R. J. Stimson II — Kansas
R. K. Sturm — Utah
D. K. Sullivan — Arkansas
J. Taveras — Rhode Island
G. Teel — California
S. R. Townsend — Prince Edward Island, Canada
R. D. Troutt — Texas
D. M. Warburton — Florida
M. Washington — New Jersey
E. Wiggins — Alabama

INTERNATIONAL INTEREST REVIEW GROUP

V. Felix
Y.-G. Kim
S. H. Leong
W. Lin
O. F. Manafa
C. Minu
Y.-W. Park
A. R. Reynaga Nogales
P. Williamson

COMMITTEE ON POWER BOILERS (BPV I)

R. E. McLaughlin, *Chair*
E. M. Ortman, *Vice Chair*
U. D'Urso, *Staff Secretary*
D. I. Anderson
J. L. Arnold
K. K. Coleman
P. D. Edwards
J. G. Feldstein
S. Fincher
G. W. Galanes
T. E. Hansen
J. F. Henry
J. S. Hunter
M. Ishikawa
G. B. Komora
F. Massi
L. Moedinger
P. A. Molvie
Y. Oishi
D. E. Tompkins
D. E. Tuttle
J. Vattappilly
M. Wadkinson
R. V. Wielgoszinski
F. Zeller
H. Michael, *Delegate*
D. L. Berger, *Honorary Member*
D. N. French, *Honorary Member*
J. Hainsworth, *Honorary Member*
W. L. Lowry, *Honorary Member*
J. R. MacKay, *Honorary Member*
T. C. McGough, *Honorary Member*
J. T. Pillow, *Honorary Member*
B. W. Roberts, *Honorary Member*
R. D. Schueler, Jr., *Honorary Member*
J. M. Tanzosh, *Honorary Member*
R. L. Williams, *Honorary Member*
L. W. Yoder, *Honorary Member*

Executive Committee (BPV I)

E. M. Ortman, *Chair*
R. E. McLaughlin, *Vice Chair*
D. I. Anderson
J. L. Arnold
J. R. Braun
K. K. Coleman
H. Dalal
T. Dhanraj
U. D'Urso
P. F. Gilston
K. Hayes
P. Jennings
A. Spangenberg
D. E. Tompkins

Subgroup on Design (BPV I)

D. I. Anderson, *Chair*
L. S. Tsai, *Secretary*
P. Becker
D. Dewees
G. B. Komora
L. Krupp
P. A. Molvie
N. Ranck
J. Vattappilly
M. Wadkinson
J. P. Glaspie, *Contributing Member*

Subgroup on Fabrication and Examination (BPV I)

J. L. Arnold, *Chair*
P. F. Gilston, *Vice Chair*
P. Becker, *Secretary*
A. Biesecker
K. K. Coleman
S. Fincher
G. W. Galanes
T. E. Hansen
P. Jennings
M. Lewis
C. T. McDaris
R. E. McLaughlin
R. J. Newell
Y. Oishi
R. V. Wielgoszinski

Subgroup on General Requirements and Piping (BPV I)

E. M. Ortman, *Chair*
D. E. Tompkins, *Vice Chair*
F. Massi, *Secretary*
P. D. Edwards
T. E. Hansen
M. Ishikawa
M. Lemmons
R. E. McLaughlin
L. Moedinger
B. J. Mollitor
Y. Oishi
D. E. Tuttle
M. Wadkinson
R. V. Wielgoszinski
W. L. Lowry, *Contributing Member*

Subgroup on Locomotive Boilers (BPV I)

J. R. Braun, *Chair*
S. M. Butler, *Secretary*
A. Biesecker
C. Cross
G. W. Galanes
D. W. Griner
M. A. Janssen
S. A. Lee
L. Moedinger
G. M. Ray
M. W. Westland

Subgroup on Materials (BPV I)

K. K. Coleman, *Chair*
K. Hayes, *Vice Chair*
M. Lewis, *Secretary*
S. H. Bowes
G. W. Galanes
P. F. Gilston
J. F. Henry
J. S. Hunter
E. Liebl
F. Masuyama
M. Ortolani
D. W. Rahoi
J. Vattappilly
F. Zeller
B. W. Roberts, *Contributing Member*
J. M. Tanzosh, *Contributing Member*

Subgroup on Solar Boilers (BPV I)

P. Jennings, *Chair*
R. E. Hearne, *Secretary*
S. Fincher
J. S. Hunter
F. Massi
P. Swarnkar

Task Group on Modernization (BPV I)

D. I. Anderson, *Chair*
U. D'Urso, *Staff Secretary*
J. L. Arnold
D. Dewees
G. W. Galanes
J. P. Glaspie
T. E. Hansen
J. F. Henry
R. E. McLaughlin
P. A. Molvie
E. M. Ortman
D. E. Tuttle
J. Vattappilly

Germany International Working Group (BPV I)

A. Spangenberg, *Chair*
P. Chavdarov, *Secretary*
B. Daume
J. Fleischfresser
R. Kauer
D. Koelbl
S. Krebs
T. Ludwig
R. A. Meyers
H. Michael
F. Miunske
M. Sykora
R. Helmholdt, *Contributing Member*
J. Henrichsmeyer, *Contributing Member*
B. Müller, *Contributing Member*
P. Paluszkiewicz, *Contributing Member*
R. Uebel, *Contributing Member*

India International Working Group (BPV I)

H. Dalal, *Chair*
T. Dhanraj, *Vice Chai*
K. Thanupillai, *Secretary*
P. Brahma
S. Chakrabarti
A. Hantodkar
S. A. Kumar
A. J. Patil
A. R. Patil
S. Purkait
M. G. Rao
U. Revisankaran
G. U. Shanker
D. K. Shrivastava
K. Singha
R. Sundararaj
S. Venkataramana

COMMITTEE ON MATERIALS (BPV II)

J. Cameron, *Chair*
J. F. Grubb, *Vice Chair*
C. E. O'Brien, *Staff Secretary*
A. Appleton
P. Chavdarov
J. R. Foulds
D. W. Gandy
J. A. Hall
J. F. Henry
K. M. Hottle
M. Ishikawa
K. Kimura
F. Masuyama
K. E. Orie
D. W. Rahoi
W. Ren
E. Shapiro
R. C. Sutherlin
F. Zeller
O. Oldani, *Delegate*
F. Abe, *Contributing Member*
A. Chaudouet, *Contributing Member*
D. B. Denis, *Contributing Member*
J. D. Fritz, *Contributing Member*
W. Hoffelner, *Contributing Member*
M. Katcher, *Contributing Member*
R. K. Nanstad, *Contributing Member*
M. L. Nayyar, *Contributing Member*
D. T. Peters, *Contributing Member*
B. W. Roberts, *Contributing Member*
J. J. Sanchez-Hanton, *Contributing Member*
R. W. Swindeman, *Contributing Member*
J. M. Tanzosh, *Contributing Member*
E. Upitis, *Contributing Member*
R. G. Young, *Contributing Member*
T. M. Cullen, *Honorary Member*
W. D. Edsall, *Honorary Member*
G. C. Hsu, *Honorary Member*
C. E. Spaeder, Jr., *Honorary Member*
A. W. Zeuthen, *Honorary Member*

Executive Committee (BPV II)

J. Cameron, *Chair*
C. E. O'Brien, *Staff Secretary*
A. Appleton
G. W. Galanes
J. F. Grubb
J. F. Henry
M. Ishikawa
D. L. Kurle
R. W. Mikitka
E. Shapiro
R. C. Sutherlin

Subgroup on External Pressure (BPV II)

D. L. Kurle, *Chair*
S. Guzey, *Vice Chair*
J. A. A. Morrow, *Secretary*
E. Alexis
L. F. Campbell
H. Chen
D. S. Griffin
J. F. Grubb
M. H. Jawad
S. Krishnamurthy
R. W. Mikitka
P. K. Rai
M. Wadkinson
M. Katcher, *Contributing Member*

Subgroup on Ferrous Specifications (BPV II)

A. Appleton, *Chair*
K. M. Hottle, *Vice Chair*
C. Hyde, *Secretary*
B. M. Dingman
M. J. Dosdourian
O. Elkadim
D. Fialkowski
J. F. Grubb
J. Gundlach
D. S. Janikowski
S. G. Lee
W. C. Mack
K. E. Orie
D. Poweleit
E. Upitis
J. D. Fritz, *Contributing Member*

Subgroup on International Material Specifications (BPV II)

M. Ishikawa, *Chair*
A. R. Nywening, *Vice Chair*
B. Mruk, *Secretary*
A. Chaudouet
P. Chavdarov
H. Chen
A. F. Garbolevsky
D. O. Henry
W. M. Lundy
F. Zeller
C. Zhou
O. Oldani, *Delegate*
H. Lorenz, *Contributing Member*
T. F. Miskell, *Contributing Member*
E. Upitis, *Contributing Member*

Subgroup on Nonferrous Alloys (BPV II)

E. Shapiro, *Chair*
S. Yem, *Vice Chair*
J. Robertson, *Secretary*
R. M. Beldyk
J. M. Downs
J. F. Grubb
W. MacDonald
D. Maitra
J. A. McMaster
D. W. Rahoi
W. Ren
R. C. Sutherlin
J. Weritz
A. Williams
R. Wright
D. B. Denis, *Contributing Member*
M. Katcher, *Contributing Member*
D. T. Peters, *Contributing Member*

Subgroup on Physical Properties (BPV II)

J. F. Grubb, *Chair*
P. K. Rai, *Vice Chair*
G. Aurioles, Sr.
D. Chandiramani
P. Chavdarov
H. Eshraghi
B. F. Hantz
R. D. Jones
P. K. Lam
S. Neilsen
D. W. Rahoi
E. Shapiro
D. K. Verma
S. Yem
D. B. Denis, *Contributing Member*

Subgroup on Strength, Ferrous Alloys (BPV II)

S. W. Knowles, *Vice Chair*
L. S. Nicol, *Secretary*
J. R. Foulds
G. W. Galanes
J. A. Hall
J. F. Henry
M. Ishikawa
F. Masuyama
M. Ortolani
M. Osterfoss
D. W. Rahoi
S. Rosinski
M. Ueyama
F. Zeller
F. Abe, *Contributing Member*
A. Di Rienzo, *Contributing Member*
M. Nair, *Contributing Member*
R. G. Young, *Contributing Member*

Subgroup on Strength of Weldments (BPV II & BPV IX)

G. W. Galanes, *Chair*
K. L. Hayes, *Vice Chair*
S. H. Bowes, *Secretary*
K. K. Coleman
M. Denault
J. R. Foulds
D. W. Gandy
M. Ghahremani
J. F. Henry
W. F. Newell, Jr.
J. Penso
D. W. Rahoi
B. W. Roberts
W. J. Sperko
J. P. Swezy, Jr.
M. Ueyama
P. D. Flenner, *Contributing Member*
J. J. Sanchez-Hanton, *Contributing Member*

Working Group on Materials Database (BPV II)

W. Hoffelner, *Vice Chair*
C. E. O'Brien, *Staff Secretary*
F. Abe
J. R. Foulds
J. F. Henry
R. C. Sutherlin
D. Andrei, *Contributing Member*
J. L. Arnold, *Contributing Member*
D. T. Peters, *Contributing Member*
W. Ren, *Contributing Member*
B. W. Roberts, *Contributing Member*
R. W. Swindeman, *Contributing Member*

Working Group on Creep Strength Enhanced Ferritic Steels (BPV II)

M. Ortolani, *Chair*
G. W. Galanes, *Vice Chair*
S. H. Bowes
K. K. Coleman
J. R. Foulds
J. F. Henry
M. Lang
S. Luke
F. Masuyama
T. Melfi
W. F. Newell, Jr.
J. J. Sanchez-Hanton
J. A. Siefert
W. J. Sperko
F. Zeller
F. Abe, *Contributing Member*
G. Cumino, *Contributing Member*
P. D. Flenner, *Contributing Member*
R. W. Swindeman, *Contributing Member*
J. M. Tanzosh, *Contributing Member*

Working Group on Data Analysis (BPV II)

J. F. Grubb, *Chair*
J. R. Foulds, *Vice Chair*
J. F. Henry
F. Masuyama
M. Ortolani
W. Ren
M. Subanovic
M. J. Swindeman
F. Abe, *Contributing Member*
W. Hoffelner, *Contributing Member*
M. Katcher, *Contributing Member*
D. T. Peters, *Contributing Member*
B. W. Roberts, *Contributing Member*
R. W. Swindeman, *Contributing Member*

China International Working Group (BPV II)

S. Liu, *Chair*
Yong Zhang, *Vice Chair*
A. T. Xu, *Secretary*
W. Fang
Q. C. Feng
S. Huo
F. Kong
H. Li
J. Li
S. Li
Z. Rongcan
S. Tan
C. Wang
J. Wang
Q.-J. Wang
X. Wang
F. Yang
G. Yang
H.-C. Yang
J. Yang
R. Ye
L. Yin
H. Zhang
X.-H. Zhang
Yingkai Zhang
Q. Zhao
S. Zhao

COMMITTEE ON CONSTRUCTION OF NUCLEAR FACILITY COMPONENTS (BPV III)

R. B. Keating, *Chair*
T. M. Adams, *Vice Chair*
D. E. Matthews, *Vice Chair*
K. Verderber, *Staff Secretary*
A. Appleton
S. Asada
R. W. Barnes
W. H. Borter
M. E. Cohen
R. P. Deubler
P. R. Donavin
A. C. Eberhardt
J. V. Gardiner
J. Grimm
S. Hunter
R. M. Jessee
R. I. Jetter
C. C. Kim
G. H. Koo
V. Kostarev
M. A. Lockwood
K. A. Manoly
K. Matsunaga
B. McGlone
S. McKillop
J. C. Minichiello
M. N. Mitchell
T. Nagata
J. B. Ossmann
S. Pellet
E. L. Pleins
S. Sham
W. J. Sperko
C. T. Smith, *Contributing Member*
W. K. Sowder, Jr., *Contributing Member*
M. Zhou, *Contributing Member*
D. K. Morton, *Honorary Member*
R. F. Reedy, Sr., *Honorary Member*

Executive Committee (BPV III)

R. B. Keating, *Chair*
K. Verderber, *Staff Secretary*
T. M. Adams
P. R. Donavin
J. V. Gardiner
J. Grimm
D. E. Matthews
S. McKillop
J. A. Munshi
S. Sham
W. K. Sowder, Jr.

Subcommittee on Design (BPV III)

P. R. Donavin, *Chair*
R. P. Deubler
M. A. Gray
R. I. Jetter
R. B. Keating
K. A. Manoly
D. E. Matthews
S. McKillop
M. N. Mitchell
S. Sham
W. F. Weitze
G. L. Hollinger, *Contributing Member*
M. H. Jawad, *Contributing Member*
W. J. O'Donnell, Sr., *Contributing Member*
K. Wright, *Contributing Member*

Subgroup on Component Design (SC-D) (BPV III)

D. E. Matthews, *Chair*
P. Vock, *Vice Chair*
S. Pellet, *Secretary*
T. M. Adams
D. J. Ammerman
G. A. Antaki
S. Asada
J. F. Ball
C. Basavaraju
D. Chowdhury
R. P. Deubler
P. Hirschberg
M. Kassar
R. B. Keating
D. Keck
O.-S. Kim
T. R. Liszkai
K. A. Manoly
R. J. Masterson
J. C. Minichiello
T. Mitsuhashi
D. Murphy
T. M. Musto
T. Nagata
J. R. Stinson
G. Z. Tokarski
J. P. Tucker
S. Willoughby-Braun
C. Wilson
A. A. Dermenjian, *Contributing Member*
I. Saito, *Contributing Member*
K. R. Wichman, *Honorary Member*

Working Group on Core Support Structures (SG-CD) (BPV III)

D. Keck, *Chair*
R. Z. Ziegler, *Vice Chair*
R. Martin, *Secretary*
G. W. Delport
L. C. Hartless
T. R. Liszkai
H. S. Mehta
M. Nakajima
M. D. Snyder
R. Vollmer
T. M. Wiger
C. Wilson
Y. Wong
A. Tsirigotis, *Alternate*
J. F. Kielb, *Contributing Member*

Working Group on Design of Division 3 Containment Systems (SG-CD) (BPV III)

D. J. Ammerman, *Chair*
S. Klein, *Secretary*
V. Broz
D. W. Lewis
A. Rigato
D. Siromani
X. Zhai
X. Zhang
J. C. Minichiello, *Contributing Member*

Working Group on HDPE Design of Components (SG-CD) (BPV III)

T. M. Musto, *Chair*
J. B. Ossmann, *Secretary*
M. Brandes
S. Choi
J. R. Hebeisen
P. Krishnaswamy
M. Kuntz
K. A. Manoly
M. Martin
D. P. Munson
F. J. Schaaf, Jr.
R. Stakenborghs
J. Wright
M. T. Audrain, *Alternate*
D. Burwell, *Contributing Member*
J. C. Minichiello, *Contributing Member*

Working Group on Piping (SG-CD) (BPV III)

G. A. Antaki, *Chair*
G. Z. Tokarski, *Secretary*
C. Basavaraju
J. Catalano
F. Claeys
C. M. Faidy
R. Farrell
R. G. Gilada
N. M. Graham
M. A. Gray
R. W. Haupt
A. Hirano
P. Hirschberg
M. Kassar
J. Kawahata
V. Kostarev
D. Lieb
T. B. Littleton
J. F. McCabe
I.-K. Nam
J. O'Callaghan
K. E. Reid II
N. C. Sutherland
D. Vlaicu
S. Weindorf
C.-I. Wu
T. M. Adams, *Contributing Member*
R. J. Gurdal, *Contributing Member*
R. B. Keating, *Contributing Member*
Y. Liu, *Contributing Member*
J. C. Minichiello, *Contributing Member*
A. N. Nguyen, *Contributing Member*
M. S. Sills, *Contributing Member*
E. A. Wais, *Contributing Member*

Working Group on Pressure Relief (SG-CD) (BPV III)

J. F. Ball, *Chair*
K. R. May, *Vice Chair*
R. Krithivasan, *Secretary*
J. W. Dickson
S. Jones
R. Lack
D. Miller
T. Patel
K. Shores
I. H. Tseng
J. Yu
N. J. Hansing, *Alternate*
J. M. Levy, *Alternate*
B. J. Yonsky, *Alternate*
S. T. French, *Contributing Member*
D. B. Ross, *Contributing Member*
S. Ruesenberg, *Contributing Member*

Working Group on Pumps (SG-CD) (BPV III)

D. Chowdhury, *Chair*
J. V. Gregg, Jr., *Secretary*
M. D. Eftychiou
R. A. Fleming
S. Hughes
J. Kikushima
K. J. Noel
J. Sulley
A. G. Washburn
Y. Wong
I. H. Tseng, *Alternate*
X. Di, *Contributing Member*
C. Gabhart, *Contributing Member*
R. Ladefian, *Contributing Member*

Working Group on Supports (SG-CD) (BPV III)

J. R. Stinson, *Chair*
U. S. Bandyopadhyay, *Secretary*
K. Avrithi
F. J. Birch
N. M. Bisceglia
R. P. Deubler
N. M. Graham
Y. Matsubara
S. Pellet
G. Z. Tokarski
A. Tsirigotis
L. Vandersip
P. Wiseman
J. Huang, *Alternate*
R. J. Masterson, *Contributing Member*

Working Group on Valves (SG-CD) (BPV III)

P. Vock, *Chair*
S. Jones, *Secretary*
M. C. Buckley
A. Cardillo
R. Farrell
G. A. Jolly
J. Lambin
T. Lippucci
C. A. Mizer
H. O'Brien
J. O'Callaghan
K. E. Reid II
J. Sulley
I. H. Tseng
J. P. Tucker
N. J. Hansing, *Alternate*

Working Group on Vessels (SG-CD) (BPV III)

D. Murphy, *Chair*
S. Willoughby-Braun, *Secretary*
J. Arthur
C. Basavaraju
D. Keck
J. I. Kim
O.-S. Kim
D. E. Matthews
T. Mitsuhashi
T. J. Schriefer
M. C. Scott
P. K. Shah
C. Turylo
D. Vlaicu
C. Wilson
T. Yamazaki
R. Z. Ziegler
B. Basu, *Contributing Member*
R. B. Keating, *Contributing Member*
W. F. Weitze, *Contributing Member*

Subgroup on Design Methods (SC-D) (BPV III)

S. McKillop, *Chair*
P. R. Donavin, *Vice Chair*
J. Wen, *Secretary*
K. Avrithi
L. Davies
R. Farrell
S. R. Gosselin
M. A. Gray
J. V. Gregg, Jr.
K. Hsu
R. Kalnas
D. Keck
J. I. Kim
W. J. O'Donnell, Sr.
W. D. Reinhardt
P. Smith
S. D. Snow
R. Vollmer
W. F. Weitze
T. M. Adams, *Contributing Member*
C. W. Bruny, *Contributing Member*
H. T. Harrison III, *Contributing Member*
K. Wright, *Contributing Member*

Working Group on Design Methodology (SG-DM) (BPV III)

R. Farrell, *Chair*
R. Vollmer, *Secretary*
K. Avrithi
C. Basavaraju
C. M. Faidy
C. F. Heberling II
M. Kassar
J. I. Kim
T. R. Liszkai
K. Matsunaga
S. McKillop
B. Pellereau
S. Ranganath
W. D. Reinhardt
P. K. Shah
S. D. Snow
S. Wang
W. F. Weitze
J. Wen
T. M. Wiger
G. Banyay, *Contributing Member*
D. S. S. Bartran, *Contributing Member*
R. D. Blevins, *Contributing Member*
M. R. Breach, *Contributing Member*
C. W. Bruny, *Contributing Member*
D. L. Caldwell, *Contributing Member*
H. T. Harrison III, *Contributing Member*
P. Hirschberg, *Contributing Member*
R. B. Keating, *Contributing Member*
A. Walker, *Contributing Member*
K. Wright, *Contributing Member*

Working Group on Environmental Fatigue Evaluation Methods (SG-DM) (BPV III)

M. A. Gray, *Chair*
W. F. Weitze, *Secretary*
S. Asada
K. Avrithi
R. C. Cipolla
T. M. Damiani
C. M. Faidy
T. D. Gilman
S. R. Gosselin
Y. He
A. Hirano
P. Hirschberg
H. S. Mehta
J.-S. Park
B. Pellereau
G. L. Stevens
D. Vlaicu
K. Wang
R. Z. Ziegler
S. Cuvilliez, *Contributing Member*
K. Wright, *Contributing Member*

Working Group on Fatigue Strength (SG-DM) (BPV III)

P. R. Donavin, *Chair*
M. S. Shelton, *Secretary*
T. M. Damiani
D. W. DeJohn
C. M. Faidy
P. Gill
S. R. Gosselin
R. J. Gurdal
C. F. Heberling II
C. E. Hinnant
P. Hirschberg
K. Hsu
J. I. Kim
S. H. Kleinsmith
H. S. Mehta
B. Pellereau
S. Ranganath
G. L. Stevens
Y. Wang
W. F. Weitze
Y. Zou
D. Dewees, *Contributing Member*
S. Majumdar, *Contributing Member*
W. J. O'Donnell, Sr., *Contributing Member*
K. Wright, *Contributing Member*

Working Group on Probabilistic Methods in Design (SG-DM) (BPV III)

M. Golliet, *Chair*
R. Kalnas, *Vice Chair*
T. Asayama
K. Avrithi
G. Brouette
J. Hakii
D. O. Henry
A. Hirano
A. Martin
P. J. O'Regan
B. Pellereau
R. S. Hill III, *Contributing Member*

Special Working Group on Computational Modeling for Explicit Dynamics (SG-DM) (BPV III)

D. J. Ammerman, *Vice Chair*
V. Broz, *Secretary*
J. M. Jordan
S. Kuehner
D. Molitoris
W. D. Reinhardt
P. Y.-K. Shih
S. D. Snow
C.-F. Tso
M. C. Yaksh
U. Zencker

Working Group on Allowable Stress Criteria (SG-HTR) (BPV III)

R. Wright, *Chair*
M. McMurtrey, *Secretary*
K. Kimura
D. Maitra
R. J. McReynolds
M. C. Messner
W. Ren
R. Rupp
S. Sham
Y. Wang
X. Wei
J. R. Foulds, *Contributing Member*
R. W. Swindeman, *Contributing Member*

Working Group on Analysis Methods (SG-HTR) (BPV III)

M. C. Messner, *Chair*
R. W. Barnes
J. A. Blanco
P. Carter
M. E. Cohen
R. I. Jetter
G. H. Koo
H. Qian
S. Sham
X. Wei
S. X. Xu
T. Hassan, *Contributing Member*
S. Krishnamurthy, *Contributing Member*
M. J. Swindeman, *Contributing Member*

Working Group on Creep-Fatigue and Negligible Creep (SG-HTR) (BPV III)

S. Sham, *Chair*
Y. Wang, *Secretary*
M. Ando
F. W. Brust
P. Carter
M. E. Cohen
R. I. Jetter
G. H. Koo
M. McMurtrey
M. C. Messner
J. C. Poehler
H. Qian
X. Wei

Working Group on High Temperature Flaw Evaluation (SG-HTR) (BPV III)

F. W. Brust, *Chair*
P. Carter
S. Kalyanam
B.-L. Lyow
M. C. Messner
J. C. Poehler
H. Qian
P. J. Rush
C. J. Sallaberry
D. J. Shim
X. Wei
S. X. Xu

Subgroup on General Requirements (BPV III)

J. V. Gardiner, *Chair*
N. DeSantis, *Secretary*
V. Apostolescu
A. Appleton
S. Bell
J. R. Berry
G. Brouette
G. C. Deleanu
J. W. Highlands
E. V. Imbro
K. A. Kavanagh
Y.-S. Kim
B. McGlone
E. C. Renaud
T. N. Rezk
J. Rogers
D. J. Roszman
R. Spuhl
G. E. Szabatura
D. M. Vickery
J. DeKleine, *Contributing Member*
H. Michael, *Contributing Member*
C. T. Smith, *Contributing Member*
W. K. Sowder, Jr., *Contributing Member*

Working Group on General Requirements (SG-GR) (BPV III)

B. McGlone, *Chair*
J. Grimm, *Secretary*
V. Apostolescu
A. Appleton
S. Bell
J. R. Berry
G. Brouette
J. Carter
P. J. Coco
N. DeSantis
Y. Diaz-Castillo
O. Elkadim
J. V. Gardiner
S. M. Goodwin
J. Harris
J. W. Highlands
E. V. Imbro
K. A. Kavanagh
Y.-S. Kim
D. T. Meisch
R. B. Patel
E. C. Renaud
T. N. Rezk
J. Rogers
D. J. Roszman
B. S. Sandhu
R. Spuhl
J. F. Strunk
G. E. Szabatura
D. M. Vickery
J. L. Williams
J. DeKleine, *Contributing Member*
S. F. Harrison, Jr., *Contributing Member*

Special Working Group on General Requirements Consolidation (SG-GR) (BPV III)

J. V. Gardiner, *Chair*
J. Grimm, *Vice Chair*
C. T. Smith, *Vice Chair*
Y. Diaz-Castillo
R. B. Patel
E. C. Renaud
R. Spuhl
J. L. Williams

Working Group on General Requirements for Graphite and Ceramic Composite Core Components and Assemblies (SG-GR) (BPV III)

A. Appleton, *Chair*
W. J. Geringer, *Secretary*
J. R. Berry
Y. Diaz-Castillo
M. N. Mitchell
E. C. Renaud
W. Windes

Subgroup on Materials, Fabrication, and Examination (BPV III)

J. Grimm, *Chair*
S. Hunter, *Secretary*
W. H. Borter
G. R. Cannell
S. Cho
P. J. Coco
R. H. Davis
B. D. Frew
D. W. Gandy
S. E. Gingrich
M. Golliet
L. S. Harbison
R. M. Jessee
J. Johnston, Jr.
C. C. Kim
M. Kris
M. Lashley
D. W. Mann
T. Melfi
I.-K. Nam
J. B. Ossmann
J. E. O'Sullivan
M. C. Scott
W. J. Sperko
J. R. Stinson
J. F. Strunk
W. Windes
R. Wright
S. Yee
H. Michael, *Delegate*
R. W. Barnes, *Contributing Member*
D. B. Denis, *Contributing Member*

Working Group on HDPE Materials (SG-MFE) (BPV III)

G. Brouette, *Chair*
M. A. Martin, *Secretary*
M. C. Buckley
M. Golliet
J. Johnston, Jr.
P. Krishnaswamy
M. Kuntz
B. Lin
D. P. Munson
T. M. Musto
S. Patterson
S. Schuessler
R. Stakenborghs
M. Troughton
J. Wright
B. Hauger, *Contributing Member*

Joint ACI-ASME Committee on Concrete Components for Nuclear Service (BPV III)

J. A. Munshi, *Chair*
J. McLean, *Vice Chair*
J. Cassamassino, *Staff Secretary*
C. J. Bang
L. J. Colarusso
A. C. Eberhardt
F. Farzam
P. S. Ghosal
B. D. Hovis
T. C. Inman
C. Jones
O. Jovall
T. Kang
N.-H. Lee
T. Muraki
N. Orbovic
J. F. Strunk
G. Thomas
S. Wang
A. Adediran, *Contributing Member*
J. F. Artuso, *Contributing Member*
S. Bae, *Contributing Member*
J.-B. Domage, *Contributing Member*
B. B. Scott, *Contributing Member*
M. R. Senecal, *Contributing Member*
Z. Shang, *Contributing Member*
M. Sircar, *Contributing Member*
C. T. Smith, *Contributing Member*

Working Group on Design (BPV III-2)

N.-H. Lee, *Chair*
S. Wang, *Vice Chair*
M. Allam
S. Bae
L. J. Colarusso
A. C. Eberhardt
F. Farzam
P. S. Ghosal
B. D. Hovis
T. C. Inman
C. Jones
O. Jovall
J. A. Munshi
T. Muraki
N. Orbovic
J. S. Saini
G. Thomas
A. Istar, *Contributing Member*
S.-Y. Kim, *Contributing Member*
J. Kwon, *Contributing Member*
B. B. Scott, *Contributing Member*
Z. Shang, *Contributing Member*
M. Shin, *Contributing Member*
M. Sircar, *Contributing Member*

Working Group on Materials, Fabrication, and Examination (BPV III-2)

C. Jones, *Chair*
A. Eberhardt, *Vice Chair*
M. Allam
C. J. Bang
B. Birch
J.-B. Domage
P. S. Ghosal
T. Kang
N.-H. Lee
Z. Shang
J. F. Strunk
I. Zivanovic
A. A. Aboelmagd, *Contributing Member*
J. F. Artuso, *Contributing Member*
B. B. Scott, *Contributing Member*

Special Working Group on Modernization (BPV III-2)

N. Orbovic, *Chair*
J. McLean, *Vice Chair*
A. Adediran
O. Jovall
N. Stoeva
A. Varma
S. Wang
I. Zivanovic
J.-B. Domage, *Contributing Member*
F. Lin, *Contributing Member*
M. A. Ugalde, *Contributing Member*

Subgroup on Containment Systems for Spent Nuclear Fuel and High-Level Radioactive Material (BPV III)

G. J. Solovey, *Chair*
D. J. Ammerman, *Vice Chair*
S. Klein, *Secretary*
G. Bjorkman
V. Broz
D. W. Lewis
E. L. Pleins
A. Rigato
P. Sakalaukus, Jr.
D. Siromani
D. B. Spencer
J. Wellwood
X. J. Zhai
X. Zhang
D. Dunn, *Alternate*
W. H. Borter, *Contributing Member*
N. M. Simpson, *Contributing Member*

Subgroup on Fusion Energy Devices (BPV III)

W. K. Sowder, Jr., *Chair*
D. Andrei, *Staff Secretary*
D. J. Roszman, *Secretary*
M. Bashir
J. P. Blanchard
L. C. Cadwallader
T. P. Davis
B. R. Doshi
L. El-Guebaly
G. Holtmeier
D. Johnson
K. A. Kavanagh
K. Kim
I. Kimihiro
S. Lee
G. Li
X. Li
P. Mokaria
T. R. Muldoon
M. Porton
F. J. Schaaf, Jr.
P. Smith
Y. Song
M. Trosen
C. Waldon
I. J. Zatz
R. W. Barnes, *Contributing Member*

Working Group on General Requirements (BPV III-4)

D. J. Roszman, *Chair*
M. Ellis
P. Mokaria
W. K. Sowder, Jr.

Working Group on In-Vessel Components (BPV III-4)

M. Bashir, *Chair*
Y. Carin
T. P. Davis
M. Kalsey
S. T. Madabusi

Working Group on Magnets (BPV III-4)

S. Lee, *Chair*
K. Kim, *Vice Chair*

Working Group on Materials (BPV III-4)

M. Porton, *Chair*
T. P. Davis
P. Mummery

Working Group on Vacuum Vessels (BPV III-4)

I. Kimihiro, *Chair*
L. C. Cadwallader
B. R. Doshi
D. Johnson
Q. Shijun
Y. Song

Subgroup on High Temperature Reactors (BPV III)

S. Sham, *Chair*
M. Ando
N. Broom
F. W. Brust
P. Carter
M. E. Cohen
W. J. Geringer
B. F. Hantz
M. H. Jawad
R. I. Jetter
K. Kimura
G. H. Koo
A. Mann
M. C. Messner
X. Wei
W. Windes
R. Wright
A. Yeshnik
G. L. Zeng
A. Tsirigotis, *Alternate*
D. S. Griffin, *Contributing Member*
X. Li, *Contributing Member*
S. Majumdar, *Contributing Member*
D. L. Marriott, *Contributing Member*
M. Morishita, *Contributing Member*
W. O'Donnell, Sr., *Contributing Member*
L. Shi, *Contributing Member*
R. W. Swindeman, *Contributing Member*

Working Group on Nonmetallic Design and Materials (SG-HTR) (BPV III)

W. Windes, *Chair*
W. J. Geringer, *Vice Chair*
A. Appleton
T. D. Burchell
S.-H. Chi
V. Chugh
S. T. Gonczy
K. Harris
M. G. Jenkins
Y. Katoh
J. Lang
M. N. Mitchell
J. B. Ossmann
A. Yeshnik
G. L. Zeng

Special Working Group on High Temperature Reactor Stakeholders (SG-HTR) (BPV III)

M. E. Cohen, *Chair*
M. Arcaro
R. W. Barnes
N. Broom
V. Chugh
R. A. Fleming
K. Harris
R. I. Jetter
Y. W. Kim
G. H. Koo
K. J. Noel
S. Sham
B. Song
X. Wei
A. Yeshnik
G. L. Zeng
T. Asayama, *Contributing Member*
X. Li, *Contributing Member*
M. Morishita, *Contributing Member*
L. Shi, *Contributing Member*
G. Wu, *Contributing Member*

Seismic Design Steering Committee (BPV III)

T. M. Adams, *Chair*
F. G. Abatt, *Secretary*
G. A. Antaki
C. Basavaraju
A. Berkovsky
D. Chowdhury
R. Döring
G. H. Koo
V. Kostarev
A. Maekawa
K. Matsunaga
R. M. Pace
D. Watkins

Argentina International Working Group (BPV III)

J. Fernández, *Chair*
A. Politi, *Vice Chair*
O. Martinez, *Staff Secretary*
A. Gomez, *Secretary*
A. Acrogliano
W. Agrelo
G. O. Anteri
M. Anticoli
C. A. Araya
J. P. Balbiani
A. A. Betervide
D. O. Bordato
G. Bourguigne
M. L. Cappella
A. Claus
R. G. Cocco
A. Coleff
A. J. Dall'Osto
L. M. De Barberis
D. P. Delfino
D. N. Dell'Erba
F. G. Diez
A. Dominguez
S. A. Echeverria
E. P. Fresquet
M. M. Gamizo
I. M. Guerreiro
I. A. Knorr
M. F. Liendo
D. E. Matthews
L. R. Miño
J. Monte
R. L. Morard
A. E. Pastor
E. Pizzichini
J. L. Racamato
H. C. Sanzi
G. J. Scian
G. G. Sebastian
M. E. Szarko
P. N. Torano
A. Turrin
O. A. Verastegui
M. D. Vigliano
P. Yamamoto
M. Zunino

China International Working Group (BPV III)

J. Yan, *Chair*
W. Tang, *Vice Chair*
Y. He, *Secretary*
L. Guo
Y. Jing
D. Kang
Y. Li
B. Liang
H. Lin
S. Liu
W. Liu
J. Ma
K. Mao
D. E. Matthews
W. Pei
C. Peiyin
Z. Sun
G. Tang
L. Ting
Y. Tu
Y. Wang
H. Wu
S. Xue
Z. Yin
D. Yuangang
G. Zhang
W. Zhang
Y. Zhong
Z. Zhong

Germany International Working Group (BPV III)

J. Wendt, *Chair*
D. Koelbl, *Vice Chair*
R. Gersinska, *Secretary*
P. R. Donavin
R. Döring
C. G. Frantescu
A. Huber
R. E. Hueggenberg
C. Huttner
E. Iacopetta
M. H. Koeppen
C. Kuschke
H.-W. Lange
T. Ludwig
X. Pitoiset
M. Reichert
G. Roos
J. Rudolph
L. Sybert
I. Tewes
R. Tiete
R. Trieglaff
F. Wille
S. Zickler

India International Working Group (BPV III)

R. N. Sen, *Chair*
S. B. Parkash, *Vice Chair*
A. D. Bagdare, *Secretary*
S. Aithal
S. Benhur
N. M. Borwankar
M. Brijlani
H. Dalal
S. K. Goyal
A. Johori
D. Kulkarni
R. Kumar
D. Narain
E. L. Pleins
V. Sehgal
S. Singh
B. K. Sreedhar

Korea International Working Group (BPV III)

G. H. Koo, *Chair*
O.-S. Kim, *Secretary*
H. Ahn
S. Cho
G.-S. Choi
S. Choi
J. Y. Hong
N.-S. Huh
J.-K. Hwang
S. S. Hwang
C. Jang
I. I. Jeong
S. H. Kang
J.-I. Kim
J.-S. Kim
M.-W. Kim
S.-S. Kim
Y.-B. Kim
Y.-S. Kim
D. Kwon
B. Lee
D. Lee
S. Lee
S.-G. Lee
H. Lim
I.-K. Nam
C.-K. Oh
C.-Y. Oh
E.-J. Oh
C. Park
H. Park
J.-S. Park
Y. S. Pyun
T. Shin
S. Song
W. J. Sperko
J. S. Yang
O. Yoo

United Kingdom International Working Group (BPV III)

C. D. Bell, *Chair*
P. M. James, *Vice Chair*
C. B. Carpenter, *Secretary*
T. Bann
M. J. Chevalier
M. Consonni
M. J. Crathorne
G. Innes
S. A. Jones
B. Pellereau
C. R. Schneider
J. W. Stairmand
J. Sulley
J. Talamantes-Silva

Special Working Group on Editing and Review (BPV III)

D. E. Matthews, *Chair*
R. P. Deubler
A. C. Eberhardt
J. V. Gardiner
S. Hunter
J. C. Minichiello
J. F. Strunk
C. Wilson

Special Working Group on HDPE Stakeholders (BPV III)

M. Brandes, *Chair*
S. Patterson, *Secretary*
S. Choi
C. M. Faidy
M. Golliet
R. M. Jessee
J. Johnston, Jr.
M. Kuntz
M. Lashley
K. A. Manoly
D. P. Munson
T. M. Musto
J. E. O'Sullivan
V. Rohatgi
F. J. Schaaf, Jr.
R. Stakenborghs
M. Troughton
J. Wright
C. Lin, *Alternate*
D. Burwell, *Contributing Member*

Special Working Group on Honors and Awards (BPV III)

J. C. Minichiello, *Chair*
A. Appleton
R. W. Barnes
R. M. Jessee
D. E. Matthews

Special Working Group on Industry Experience for New Plants (BPV III & BPV XI)

J. T. Lindberg, *Chair*
J. B. Ossmann, *Chair*
M. C. Buckley, *Secretary*
A. Cardillo
T. L. Chan
P. J. Hennessey
D. O. Henry
J. Honcharik
C. G. Kim
O.-S. Kim
K. Matsunaga
D. E. Matthews
R. E. McLaughlin
D. W. Sandusky
R. M. Wilson
S. M. Yee
A. Tsirigotis, *Alternate*

Special Working Group on International Meetings and IWG Liaisons (BPV III)

D. E. Matthews, *Chair*
K. Verderber, *Staff Secretary*
T. M. Adams
R. W. Barnes
T. D. Burchell
R. L. Crane
P. R. Donavin
E. L. Pleins
W. J. Sperko

Special Working Group on New Plant Construction Issues (BPV III)

E. L. Pleins, *Chair*
M. C. Scott, *Secretary*
A. Cardillo
P. J. Coco
J. Honcharik
O.-S. Kim
M. Kris
D. W. Sandusky
R. R. Stevenson
M. L. Wilson
H. Xu
J. Yan
N. J. Hansing, *Alternate*
J. C. Minichiello, *Contributing Member*
K. Verderber, *Contributing Member*

COMMITTEE ON HEATING BOILERS (BPV IV)

J. A. Hall, *Chair*
T. L. Bedeaux, *Vice Chair*
C. R. Ramcharran, *Staff Secretary*
L. Badziagowski
B. Calderon
J. P. Chicoine
J. M. Downs
J. L. Kleiss
J. Klug
M. Mengon
P. A. Molvie
R. D. Troutt
M. Wadkinson
R. V. Wielgoszinski
H. Michael, *Delegate*
D. Picart, *Delegate*
D. Nelson, *Alternate*
S. V. Voorhees, *Contributing Member*

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

R. D. Troutt, *Chair*
C. R. Ramcharran, *Staff Secretary*
B. Ahee
T. L. Bedeaux
J. M. Downs
J. A. Hall
J. L. Kleiss
P. A. Molvie
M. Wadkinson

Subgroup on Cast Boilers (BPV IV)

J. P. Chicoine, *Chair*
J. M. Downs, *Vice Chair*
C. R. Ramcharran, *Staff Secretary*
T. L. Bedeaux
J. A. Hall
J. L. Kleiss
M. Mengon

Subgroup on Materials (BPV IV)

M. Wadkinson, *Chair*
J. M. Downs, *Vice Chair*
C. R. Ramcharran, *Staff Secretary*
L. Badziagowski
T. L. Bedeaux
J. A. Hall

Subgroup on Water Heaters (BPV IV)

L. Badziagowski, *Chair*
J. L. Kleiss, *Vice Chair*
C. R. Ramcharran, *Staff Secretary*
B. Ahee
J. P. Chicoine
C. Dinic
B. J. Iske
P. A. Molvie
T. E. Trant
R. D. Troutt

Subgroup on Welded Boilers (BPV IV)

T. L. Bedeaux, *Chair*
J. L. Kleiss, *Vice Chair*
C. R. Ramcharran, *Staff Secretary*
B. Ahee
L. Badziagowski
B. Calderon
C. Dinic
M. Mengon
P. A. Molvie
R. D. Troutt
M. Wadkinson
R. V. Wielgoszinski
D. Nelson, *Alternate*

COMMITTEE ON NONDESTRUCTIVE EXAMINATION (BPV V)

N. A. Finney, *Chair*
C. May, *Vice Chair*
C. R. Ramcharran, *Staff Secretary*
D. Bajula
J. Bennett
P. L. Brown
M. A. Burns
N. Carter
T. Clausing
C. Emslander
A. F. Garbolevsky
J. F. Halley
P. T. Hayes
G. W. Hembree
F. B. Kovacs
K. Krueger
B. D. Laite
L. E. Mullins
T. L. Plasek
P. B. Shaw
C. Vorwald
G. M. Gatti, *Delegate*
S. J. Akrin, *Contributing Member*
J. E. Batey, *Contributing Member*
A. S. Birks, *Contributing Member*
N. Y. Faransso, *Contributing Member*
R. W. Kruzic, *Contributing Member*
F. J. Sattler, *Contributing Member*
H. C. Graber, *Honorary Member*
O. F. Hedden, *Honorary Member*
J. R. MacKay, *Honorary Member*
T. G. McCarty, *Honorary Member*

Executive Committee (BPV V)

C. May, *Chair*
N. A. Finney, *Vice Chair*
C. R. Ramcharran, *Staff Secretary*
N. Carter
C. Emslander
V. F. Godinez-Azcuaga
J. F. Halley
P. T. Hayes
G. W. Hembree
F. B. Kovacs
C. Vorwald

Subgroup on General Requirements/Personnel Qualifications and Inquiries (BPV V)

C. Emslander, *Chair*
D. I. Morris, *Vice Chair*
J. Bennett
N. Carter
T. Clausing
N. A. Finney
J. F. Halley
G. W. Hembree
F. B. Kovacs
K. Krueger
C. May
C. Vorwald
S. J. Akrin, *Contributing Member*
J. E. Batey, *Contributing Member*
N. Y. Faransso, *Contributing Member*
J. P. Swezy, Jr., *Contributing Member*

Subgroup on Surface Examination Methods (BPV V)

N. Carter, *Chair*
B. D. Laite, *Vice Chair*
P. L. Brown
T. Clausing
C. Emslander
N. Farenbaugh
N. A. Finney
J. F. Halley
K. Hayes
G. W. Hembree
C. May
L. E. Mullins
P. B. Shaw
C. Vorwald
C. Wassink
D. M. Woodward
G. M. Gatti, *Delegate*
S. J. Akrin, *Contributing Member*
J. E. Batey, *Contributing Member*
N. Y. Faransso, *Contributing Member*
R. W. Kruzic, *Contributing Member*
F. J. Sattler, *Contributing Member*

Subgroup on Volumetric Methods (BPV V)

C. May, *Chair*
J. F. Halley, *Vice Chair*
D. Adkins
P. L. Brown
N. A. Finney
A. F. Garbolevsky
R. W. Hardy
P. T. Hayes
G. W. Hembree
F. B. Kovacs
K. Krueger
L. E. Mullins
E. Peloquin
T. L. Plasek
C. Vorwald
G. M. Gatti, *Delegate*
S. J. Akrin, *Contributing Member*
J. E. Batey, *Contributing Member*
N. Y. Faransso, *Contributing Member*
R. W. Kruzic, *Contributing Member*
F. J. Sattler, *Contributing Member*

Special Working Group on Advanced Ultrasonic Testing Techniques (BPV V)

L. E. Mullins, *Chair*
K. Krueger, *Vice Chair*
D. Adkins
D. Bajula
N. A. Finney
J. L. Garner
J. F. Halley
P. T. Hayes
M. Lozev
E. Peloquin
M. Sens
D. Tompkins
C. Wassink

Working Group on Full Matrix Capture (FMC) (BPV V)

P. T. Hayes, *Chair*
E. Peloquin, *Vice Chair*
D. Adkins
D. Bajula
D. Bellistri
J. Catty
N. A. Finney
J. L. Garner
V. F. Godinez-Azcuaga
R. T. Grotenhuis
J. F. Halley
K. Hayes
G. W. Hembree
K. Krueger
M. Lozev
L. E. Mullins
D. Richard
M. Sens
D. Tompkins
O. Volf
C. Wassink

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

V. F. Godinez-Azcuaga, *Chair*
S. R. Doctor, *Vice Chair*
J. Catty
N. F. Douglas, Jr.
R. K. Miller
L. Zhang
J. E. Batey, *Contributing Member*
N. Y. Faransso, *Contributing Member*

Working Group on Computed Tomography (BPV V)

C. May, *Chair*
T. L. Clifford
R. W. Hardy
G. W. Hembree
F. B. Kovacs
R. J. Mills
T. L. Plasek
C. Vorwald
B. White
L. E. Mullins, *Contributing Member*

Working Group on Radiography (SG-VM) (BPV V)

C. Vorwald, *Chair*
D. M. Woodward, *Vice Chair*
J. Anderson
P. L. Brown
C. Emslander
A. F. Garbolevsky
R. W. Hardy
G. W. Hembree
F. B. Kovacs
B. D. Laite
C. May
R. J. Mills
T. L. Plasek
T. Vidimos
B. White
S. J. Akrin, *Contributing Member*
J. E. Batey, *Contributing Member*
N. Y. Faransso, *Contributing Member*
R. W. Kruzic, *Contributing Member*

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

J. F. Halley, *Chair*
K. Krueger, *Vice Chair*
D. Adkins
D. Bajula
C. Brown
C. Emslander
N. A. Finney
P. T. Hayes
G. W. Hembree
B. D. Laite
C. May
L. E. Mullins
E. Peloquin
M. J. Quarry
D. Tompkins
D. Van Allen
J. Vinyard
C. Vorwald
C. Wassink
D. Alleyne, *Contributing Member*
J. E. Batey, *Contributing Member*
N. Y. Faransso, *Contributing Member*
R. W. Kruzic, *Contributing Member*
G. M. Light, *Contributing Member*
P. Mudge, *Contributing Member*
F. J. Sattler, *Contributing Member*
J. Vanvelsor, *Contributing Member*

Italy International Working Group (BPV V)

P. L. Dinelli, *Chair*
D. D. Raimander, *Secretary*
M. Agostini
T. Aldo
F. Bresciani
G. Campos
N. Caputo
M. Colombo
F. Ferrarese
E. Ferrari
M. A. Grimoldi
G. Luoni
O. Oldani
U. Papponetti
P. Pedersoli
A. Veroni
M. Zambon
V. Calo, *Contributing Member*
G. Gobbi, *Contributing Member*
G. Pontiggia, *Contributing Member*

COMMITTEE ON PRESSURE VESSELS (BPV VIII)

S. C. Roberts, *Chair*
M. D. Lower, *Vice Chair*
J. Oh, *Staff Secretary*
S. J. Rossi, *Staff Secretary*
G. Aurioles, Sr.
S. R. Babka
R. J. Basile
P. Chavdarov
D. B. DeMichael
J. F. Grubb
B. F. Hantz
M. Kowalczyk
D. L. Kurle
R. Mahadeen
S. A. Marks
P. Matkovics
R. W. Mikitka
B. R. Morelock
T. P. Pastor
D. T. Peters
M. J. Pischke
M. D. Rana
G. B. Rawls, Jr.
F. L. Richter
C. D. Rodery
J. C. Sowinski
D. Srnic
D. B. Stewart
P. L. Sturgill
K. Subramanian
D. A. Swanson
J. P. Swezy, Jr.
S. Terada
E. Upitis
A. Viet
K. Xu
P. A. McGowan, *Delegate*
H. Michael, *Delegate*
K. Oyamada, *Delegate*
M. E. Papponetti, *Delegate*
X. Tang, *Delegate*
A. Chaudouet, *Contributing Member*
J. P. Glaspie, *Contributing Member*
W. S. Jacobs, *Contributing Member*
K. T. Lau, *Contributing Member*
U. R. Miller, *Contributing Member*
K. Mokhtarian, *Contributing Member*
G. G. Karcher, *Honorary Member*
K. K. Tam, *Honorary Member*

Executive Committee (BPV VIII)

M. D. Lower, *Chair*
S. J. Rossi, *Staff Secretary*
G. Aurioles, Sr.
M. Kowalczyk
S. A. Marks
P. Matkovics
F. L. Richter
S. C. Roberts
J. C. Sowinski
K. Subramanian
A. Viet
K. Xu

Subgroup on Design (BPV VIII)

J. C. Sowinski, *Chair*
C. S. Hinson, *Vice Chair*
G. Aurioles, Sr.
S. R. Babka
O. A. Barsky
R. J. Basile
D. Chandiramani
M. Faulkner
B. F. Hantz
C. E. Hinnant
M. H. Jawad
S. Krishnamurthy
D. L. Kurle
K. Kuscu
M. D. Lower
R. W. Mikitka
B. Millet
M. D. Rana
G. B. Rawls, Jr.
S. C. Roberts
C. D. Rodery
T. G. Seipp
D. Srnic
D. A. Swanson
S. Terada
J. Vattappilly
K. Xu
K. Oyamada, *Delegate*
M. E. Papponetti, *Delegate*
W. S. Jacobs, *Contributing Member*
P. K. Lam, *Contributing Member*
K. Mokhtarian, *Contributing Member*
T. P. Pastor, *Contributing Member*
S. C. Shah, *Contributing Member*
K. K. Tam, *Contributing Member*
E. Upitis, *Contributing Member*
Z. Wang, *Contributing Member*

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

B. F. Hantz, *Chair*
T. W. Norton, *Secretary*
D. A. Arnett
J. Bedoya
S. Guzey
C. F. Heberling II
C. E. Hinnant
M. H. Jawad
S. Kataoka
S. Kilambi
K. D. Kirkpatrick
S. Krishnamurthy
A. Mann
C. Nadarajah
P. Prueter
T. G. Seipp
M. A. Shah
S. Terada
R. G. Brown, *Contributing Member*
D. Dewees, *Contributing Member*
K. Saboda, *Contributing Member*

Working Group on Elevated Temperature Design (BPV I and VIII)

A. Mann, *Chair*
C. Nadarajah, *Secretary*
D. Anderson
D. Dewees
B. F. Hantz
M. H. Jawad
R. I. Jetter
S. Krishnamurthy
T. Le
M. C. Messner
M. N. Mitchell
P. Prueter
M. J. Swindeman
J. P. Glaspie, *Contributing Member*
D. L. Marriott, *Contributing Member*
N. McMurray, *Contributing Member*
B. J. Mollitor, *Contributing Member*

Subgroup on Fabrication and Examination (BPV VIII)

S. A. Marks, *Chair*
D. I. Morris, *Vice Chair*
T. Halligan, *Secretary*
N. Carter
J. Lu
B. R. Morelock
O. Mulet
M. J. Pischke
M. J. Rice
J. Roberts
C. D. Rodery
B. F. Shelley
D. Smith
P. L. Sturgill
J. P. Swezy, Jr.
E. Upitis
C. Violand
E. A. Whittle
K. Oyamada, *Delegate*
W. J. Bees, *Contributing Member*
L. F. Campbell, *Contributing Member*
J. Lee, *Contributing Member*
J. Si, *Contributing Member*
R. Uebel, *Contributing Member*
X. Xue, *Contributing Member*
B. Yang, *Contributing Member*

Subgroup on General Requirements (BPV VIII)

F. L. Richter, *Chair*
M. Faulkner, *Vice Chair*
J. Hoskinson, *Secretary*
N. Barkley
R. J. Basile
T. P. Beirne
D. T. Davis
D. B. DeMichael
M. D. Lower
T. P. Pastor
D. K. Peetz
G. B. Rawls, Jr.
S. C. Roberts
J. C. Sowinski
P. Speranza
D. Srnic
D. B. Stewart
D. A. Swanson
R. Uebel
J. P. Glaspie, *Contributing Member*
Z. Wang, *Contributing Member*
Y. Yang, *Contributing Member*

Task Group on Fired Heater Pressure Vessels (BPV VIII)

J. Hoskinson, *Chair*
J. Bradley
W. Kim
S. Kirk
D. Nelson
T. P. Pastor
R. Robles
J. Rust
P. Shanks
E. Smith
D. Srnic
J. P. Swezy, Jr.

Task Group on Subsea Applications (BPV VIII)

M. Sarzynski, *Chair*
A. J. Grohmann, *Vice Chair*
L. P. Antalffy
R. C. Biel
J. Ellens
J. Hademenos
J. Kaculi
K. Karpanan
F. Kirkemo
C. Lan
P. Lutkiewicz
N. McKie
S. K. Parimi
R. H. Patil
J. R. Sims
M. P. Vaclavik
R. Cordes, *Contributing Member*
S. Krishna, *Contributing Member*
D. T. Peters, *Contributing Member*

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

S. Krishnamurthy, *Chair*
T. L. Anderson
K. E. Bagnoli
R. P. Deubler
B. F. Hantz
B. R. Macejko
J. Penso
M. Prager
M. D. Rana

Subgroup on Heat Transfer Equipment (BPV VIII)

P. Matkovics, *Chair*
M. D. Clark, *Vice Chair*
L. Bower, *Secretary*
G. Aurioles, Sr.
S. R. Babka
J. H. Barbee
O. A. Barsky
T. Bunyarattaphantu
A. Chaudouet
D. L. Kurle
R. Mahadeen
S. Mayeux
S. Neilsen
E. Smith
A. M. Voytko
R. P. Wiberg
I. G. Campbell, *Contributing Member*
G. G. Karcher, *Contributing Member*
J. Pasek, *Contributing Member*
D. Srnic, *Contributing Member*
Z. Tong, *Contributing Member*

Working Group on Plate Heat Exchangers (BPV VIII)

P. Matkovics, *Chair*
S. R. Babka
J. F. Grubb
V. Gudge
R. Mahadeen
S. A. Marks
D. I. Morris
M. J. Pischke
E. Smith
D. Srnic
S. Sullivan

Subgroup on High Pressure Vessels (BPV VIII)

K. Subramanian, *Chair*
M. Sarzynski, *Vice Chair*
A. P. Maslowski, *Staff Secretary*
L. P. Antalffy
R. C. Biel
P. N. Chaku
L. Fridlund
R. T. Hallman
K. Karpanan
J. Keltjens
A. K. Khare
G. M. Mital
G. T. Nelson
M. Parr
D. T. Peters
E. A. Rodriguez
E. D. Roll
J. R. Sims
E. Smith
F. W. Tatar
S. Terada
C. Tipple
R. Wink
Y. Xu
A. M. Clayton, *Contributing Member*
R. Cordes, *Contributing Member*
R. D. Dixon, *Contributing Member*
Q. Dong, *Contributing Member*
T. A. Duffey, *Contributing Member*
D. Fuenmayor, *Contributing Member*
R. M. Hoshman, *Contributing Member*
Y. Huang, *Contributing Member*
F. Kirkemo, *Contributing Member*
R. A. Leishear, *Contributing Member*
C. Romero, *Contributing Member*
K.-J. Young, *Contributing Member*
D. J. Burns, *Honorary Member*
D. M. Fryer, *Honorary Member*
G. J. Mraz, *Honorary Member*
E. H. Perez, *Honorary Member*

Subgroup on Materials (BPV VIII)

M. Kowalczyk, *Chair*
J. Cameron, *Vice Chair*
S. Kilambi, *Secretary*
P. Chavdarov
J. F. Grubb
D. Maitra
D. W. Rahoi
J. Robertson
R. C. Sutherlin
E. Upitis
K. Xu
S. Yem
A. Di Rienzo, *Contributing Member*
J. D. Fritz, *Contributing Member*
M. Katcher, *Contributing Member*
W. M. Lundy, *Contributing Member*
J. A. McMaster, *Contributing Member*
J. Penso, *Contributing Member*
B. Pletcher, *Contributing Member*
P. G. Wittenbach, *Contributing Member*
X. Wu, *Contributing Member*

Subgroup on Toughness (BPV VIII)

K. Xu, *Chair*
T. Halligan, *Vice Chair*
N. Carter
C. S. Hinson
W. S. Jacobs
S. Kilambi
D. L. Kurle
M. D. Rana
F. L. Richter
K. Subramanian
D. A. Swanson
J. P. Swezy, Jr.
S. Terada
E. Upitis
J. Vattappilly
K. Oyamada, *Delegate*
S. Krishnamurthy, *Contributing Member*
K. Mokhtarian, *Contributing Member*

Subgroup on Graphite Pressure Equipment (BPV VIII)

A. Viet, *Chair*
C. W. Cary, *Vice Chair*
G. C. Becherer
F. L. Brown
R. J. Bulgin
J. D. Clements
H. Lee, Jr.
T. Rudy
A. A. Stupica

Argentina International Working Group (BPV VIII)

A. Dominguez, *Chair*
F. P. Larrosa, *Secretary*
M. M. Acosta
R. A. Barey
C. Alderetes
F. A. Andres
L. F. Boccanera
O. S. Bretones
A. Burgueno
G. Casanas
D. H. Da Rold
J. I. Duo
M. Favareto
M. D. Kuhn
L. M. Leccese
C. Meinl
M. A. Mendez
J. J. Monaco
M. A. A. Pipponzi
D. Rizzo
R. Robles
J. C. Rubeo
S. Schamun
G. Telleria
M. M. C. Tocco

China International Working Group (BPV VIII)

X. Chen, *Chair*
B. Shou, *Vice Chair*
Z. Fan, *Secretary*
Y. Chen
Z. Chen
J. Cui
R. Duan
W. Guo
B. Han
J. Hu
Q. Hu
H. Hui
D. Luo
Y. Luo
C. Miao
X. Qian
L. Sun
B. Wang
C. Wu
F. Xu
F.-Z. Xuan
Y. Yang
K. Zhang
Yanfeng Zhang
Yijun Zhang
S. Zhao
J. Zheng
G. Zhu

Germany International Working Group (BPV VIII)

P. Chavdarov, *Chair*
M. Sykora, *Vice Chair*
B. Daume
A. Emrich
J. Fleischfresser
R. Helmholdt
R. Kauer
D. Koelbl
S. Krebs
T. Ludwig
R. A. Meyers
H. Michael
S. Reich
A. Spangenberg
G. Naumann, *Contributing Member*
P. Paluszkiewicz, *Contributing Member*
R. Uebel, *Contributing Member*

India International Working Group (BPV VIII)

D. Chandiramani, *Chair*
D. Kulkarni, *Vice Chair*
A. D. Dalal, *Secretary*
P. Arulkumar
B. Basu
P. Gandhi
S. K. Goyal
V. Jayabalan
A. Kakumanu
V. V. P. Kumar
T. Mukherjee
P. C. Pathak
S. B. Patil
D. Prabhu
A. Sadasivam
M. P. Shah
R. Tiru
V. T. Valavan
M. Sharma, *Contributing Member*

Italy International Working Group (BPV VIII)

A. Teli, *Chair*
D. D. Raimander, *Secretary*
B. G. Alborali
P. Aliprandi
A. Avogadri
A. Camanni
M. Colombo
P. Conti
D. Cortassa
P. L. Dinelli
F. Finco
M. Guglielmetti
A. F. Magri
P. Mantovani
M. Millefanti
L. Moracchioli
P. Pacor
G. Pontiggia
S. Sarti
A. Veroni
G. Gobbi, *Contributing Member*

Special Working Group on Bolted Flanged Joints (BPV VIII)

R. W. Mikitka, *Chair*
G. Aurioles, Sr.
D. Bankston, Jr.
W. Brown
H. Chen
A. Mann
W. McDaniel
M. Osterfoss
J. R. Payne
G. B. Rawls, Jr.
R. Wacker

Subgroup on Interpretations (BPV VIII)

G. Aurioles, Sr., *Chair*
J. Oh, *Staff Secretary*
S. R. Babka
J. Cameron
N. Carter
C. W. Cary
B. F. Hantz
M. Kowalczyk
D. L. Kurle
M. D. Lower
A. Mann
S. A. Marks
P. Matkovics
G. M. Mital
D. I. Morris
D. T. Peters
F. L. Richter
S. C. Roberts
C. D. Rodery
T. G. Seipp
J. C. Sowinski
D. B. Stewart
D. A. Swanson
J. P. Swezy, Jr.
J. Vattappilly
A. Viet
K. Xu
R. J. Basile, *Contributing Member*
D. B. DeMichael, *Contributing Member*
R. D. Dixon, *Contributing Member*
S. Kilambi, *Contributing Member*
R. Mahadeen, *Contributing Member*
T. P. Pastor, *Contributing Member*
P. L. Sturgill, *Contributing Member*

COMMITTEE ON WELDING, BRAZING, AND FUSING (BPV IX)

D. A. Bowers, *Chair*
M. J. Pischke, *Vice Chair*
E. Lawson, *Staff Secretary*
M. Bernasek
M. A. Boring
J. G. Feldstein
P. D. Flenner
S. E. Gingrich
K. L. Hayes
R. M. Jessee
J. S. Lee
W. M. Lundy
S. A. Marks
T. Melfi
W. F. Newell, Jr.
D. K. Peetz
E. G. Reichelt
M. J. Rice
M. B. Sims
W. J. Sperko
P. L. Sturgill
J. P. Swezy, Jr.
E. W. Woelfel
D. Pojatar, *Delegate*
A. Roza, *Delegate*
M. Consonni, *Contributing Member*
S. A. Jones, *Contributing Member*
S. Raghunathan, *Contributing Member*
M. J. Stanko, *Contributing Member*
P. L. Van Fosson, *Contributing Member*
R. K. Brown, Jr., *Honorary Member*
M. L. Carpenter, *Honorary Member*
B. R. Newmark, *Honorary Member*
S. D. Reynolds, Jr., *Honorary Member*

Subgroup on Brazing (BPV IX)

S. A. Marks, *Chair*
E. W. Beckman
A. F. Garbolevsky
N. Mohr
A. R. Nywening
M. J. Pischke
J. P. Swezy, Jr.

Subgroup on General Requirements (BPV IX)

P. L. Sturgill, *Chair*
N. Carter, *Vice Chair*
S. A. Marks, *Secretary*
J. P. Bell
D. A. Bowers
P. Gilston
M. Heinrichs
A. Howard
R. M. Jessee
D. K. Peetz
H. B. Porter
J. P. Swezy, Jr.
E. W. Woelfel
E. Molina, *Delegate*
E. W. Beckman, *Contributing Member*
B. R. Newmark, *Honorary Member*

Subgroup on Materials (BPV IX)

M. Bernasek, *Chair*
T. Anderson
E. Cutlip
M. Denault
S. E. Gingrich
L. S. Harbison
M. James
R. M. Jessee
T. Melfi
S. D. Nelson
M. J. Pischke
A. Roza
C. E. Sainz
P. L. Sturgill
C. Zanfir
V. G. V. Giunto, *Delegate*
D. J. Kotecki, *Contributing Member*
B. Krueger, *Contributing Member*
W. J. Sperko, *Contributing Member*
M. J. Stanko, *Contributing Member*

Subgroup on Plastic Fusing (BPV IX)

E. W. Woelfel, *Chair*
D. Burwell
K. L. Hayes
R. M. Jessee
J. Johnston, Jr.
J. E. O'Sullivan
E. G. Reichelt
M. J. Rice
S. Schuessler
M. Troughton
C. Violand
J. Wright

Subgroup on Strength of Weldments (BPV II and IX)

G. W. Galanes, *Chair*
K. L. Hayes, *Vice Chair*
S. H. Bowes, *Secretary*
K. K. Coleman
M. Denault
J. R. Foulds
D. W. Gandy
M. Ghahremani
J. Henry
W. F. Newell, Jr.
J. Penso
D. W. Rahoi
B. Roberts
W. J. Sperko
J. P. Swezy, Jr.
M. Ueyama
A. A. Amiri, *Contributing Member*
P. D. Flenner, *Contributing Member*
J. J. Sanchez-Hanton, *Contributing Member*

Subgroup on Welding Qualifications (BPV IX)

M. J. Rice, *Chair*
J. S. Lee, *Vice Chair*
K. L. Hayes, *Secretary*
M. Bernasek
M. A. Boring
D. A. Bowers
R. Campbell
R. B. Corbit
P. D. Flenner
L. S. Harbison
M. Heinrichs
W. M. Lundy
D. W. Mann
T. Melfi
W. F. Newell, Jr.
B. R. Newton
E. G. Reichelt
M. B. Sims
W. J. Sperko
S. A. Sprague
P. L. Sturgill
J. P. Swezy, Jr.
C. Violand
A. D. Wilson
D. Chandiramani, *Contributing Member*
M. Consonni, *Contributing Member*
M. Dehghan, *Contributing Member*
T. C. Wiesner, *Contributing Member*

Argentina International Working Group (BPV IX)

A. Burgueno, *Chair*
E. Lawson, *Staff Secretary*
B. Bardott
L. F. Boccanera
M. Favareto
C. A. Garibotti
J. A. Herrera
M. D. Kuhn
M. A. Mendez
A. E. Pastor
G. Telleria
M. M. C. Tocco

Germany International Working Group (BPV IX)

P. Chavdarov, *Chair*
A. Spangenberg, *Vice Chair*
E. Lawson, *Staff Secretary*
P. Thiebo, *Secretary*
J. Daldrup
B. Daume
J. Fleischfresser
E. Floer
S. Krebs
T. Ludwig
G. Naumann
A. Roza
K.-G. Toelle
S. Wegener
F. Wodke
R. Helmholdt

Italy International Working Group (BPV IX)

D. D. Raimander, *Chair*
M. Bernasek
A. Camanni
P. L. Dinelli
F. Ferrarese
M. Mandina
A. S. Monastra
L. Moracchioli
P. Pacor
G. Pontiggia
P. Siboni
A. Volpi
V. Calo, *Contributing Member*
G. Gobbi, *Contributing Member*

Spain International Working Group (BPV IX)

F. J. Q. Pandelo, *Chair*
F. L. Villabrille, *Vice Chair*
E. Lawson, *Staff Secretary*
F. R. Hermida, *Secretary*
C. A. Celimendiz
M. A. F. Garcia
R. G. Garcia
F. Manas
B. B. Miguel
A. D. G. Munoz
A. B. Pascual
S. Sevil
G. Gobbi, *Contributing Member*

COMMITTEE ON FIBER-REINFORCED PLASTIC PRESSURE VESSELS (BPV X)

B. Linnemann, *Chair*
B. F. Shelley, *Vice Chair*
P. D. Stumpf, *Staff Secretary*
A. L. Beckwith
F. L. Brown
J. L. Bustillos
B. R. Colley
T. W. Cowley
I. L. Dinovo
D. Eisberg
M. R. Gorman
B. Hebb
L. E. Hunt
D. L. Keeler
D. H. McCauley
N. L. Newhouse
G. Ramirez
J. R. Richter
S. L. Wagner
D. O. Yancey, Jr.
P. H. Ziehl
D. H. Hodgkinson, *Contributing Member*

COMMITTEE ON NUCLEAR INSERVICE INSPECTION (BPV XI)

R. W. Swayne, *Chair*
S. D. Kulat, *Vice Chair*
D. W. Lamond, *Vice Chair*
D. Miro-Quesada, *Staff Secretary*
J. F. Ball
W. H. Bamford
J. M. Boughman
C. Brown
S. B. Brown
T. L. Chan
R. C. Cipolla
D. R. Cordes
H. Do
E. V. Farrell, Jr.
M. J. Ferlisi
P. D. Fisher
T. J. Griesbach
J. Hakii
M. L. Hall
D. O. Henry
W. C. Holston
J. T. Lindberg
G. A. Lofthus
H. Malikowski
S. L. McCracken
S. A. Norman
C. A. Nove
T. Nuoffer
J. Nygaard
J. E. O'Sullivan
N. A. Palm
G. C. Park
A. T. Roberts III
D. A. Scarth
F. J. Schaaf, Jr.
S. Takaya
D. Vetter
T. V. Vo
D. E. Waskey
J. G. Weicks
M. Weis
Y.-K. Chung, *Delegate*
C. Ye, *Delegate*
M. L. Benson, *Alternate*
J. K. Loy, *Alternate*
R. O. McGill, *Alternate*
D. J. Shim, *Alternate*
A. Udyawar, *Alternate*
E. B. Gerlach, *Contributing Member*
B. R. Newton, *Contributing Member*
C. D. Cowfer, *Honorary Member*
D. D. Davis, *Honorary Member*
R. E. Gimple, *Honorary Member*
F. E. Gregor, *Honorary Member*
O. F. Hedden, *Honorary Member*
R. D. Kerr, *Honorary Member*
P. C. Riccardella, *Honorary Member*
R. A. West, *Honorary Member*
C. J. Wirtz, *Honorary Member*
R. A. Yonekawa, *Honorary Member*

Executive Committee (BPV XI)

S. D. Kulat, *Chair*
R. W. Swayne, *Vice Chair*
D. Miro-Quesada, *Staff Secretary*
W. H. Bamford
M. J. Ferlisi
D. W. Lamond
J. T. Lindberg
S. L. McCracken
C. A. Nove
T. Nuoffer
N. A. Palm
G. C. Park
A. T. Roberts III
M. L. Benson, *Alternate*

Argentina International Working Group (BPV XI)

F. M. Schroeter, *Chair*
O. Martinez, *Staff Secretary*
D. A. Cipolla
A. Claus
D. Costa
D. P. Delfino
D. N. Dell'Erba
A. Dominguez
S. A. Echeverria
E. P. Fresquet
M. M. Gamizo
I. M. Guerreiro
F. Llorente
R. J. Lopez
M. Magliocchi
L. R. Miño
J. Monte
M. D. Pereda
A. Politi
C. G. Real
F. J. Schaaf, Jr.
G. J. Scian
M. J. Solari
P. N. Torano
P. Yamamoto

China International Working Group (BPV XI)

J. H. Liu, *Chair*
Y. Nie, *Vice Chair*
C. Ye, *Vice Chair*
M. W. Zhou, *Secretary*
J. F. Cai
H. Chen
H. D. Chen
Y. Cheng
Y. B. Guo
Y. Hongqi
D. R. Horn
Y. Hou
S. X. Lin
W. N. Pei
L. Shiwei
S. Shuo
Y. Sixin
Y. X. Sun
G. X. Tang
Q. Wang
Q. W. Wang
Z. S. Wang
L. Xing
F. Xu
S. X. Xu
Q. Yin
K. Zhang
Y. Zhe
Z. M. Zhong

German International Working Group (BPV XI)

R. Döring, *Chair*
R. Trieglaff, *Vice Chair*
R. Piel, *Secretary*
A. Casse
S. Dugan
C. G. Frantescu
M. Hagenbruch
E. Iacopetta
S. D. Kulat
H.-W. Lange
N. Legl
T. Ludwig
X. Pitoiset
M. Reichert
L. Sybertz
I. Tewes
R. Tiete
J. Wendt
S. Zickler

India International Working Group (BPV XI)

S. B. Parkash, *Chair*
D. Narain, *Vice Chair*
K. K. Rai, *Secretary*
Z. M. Mansuri
M. R. Nadgouda
N. Palm
D. Rawal
R. Sahai
R. K. Sharma

Special Working Group on Editing and Review (BPV XI)

R. W. Swayne, *Chair*
M. Orihuela
K. R. Rao

Task Group on Inspectability (BPV XI)

J. T. Lindberg, *Chair*
E. Henry, *Secretary*
A. Cardillo
D. R. Cordes
M. J. Ferlisi
P. Gionta
D. O. Henry
J. Honcharik
R. Klein
C. Latiolais
G. A. Lofthus
S. Matsumoto
D. E. Matthews
P. J. O'Regan
J. B. Ossmann
S. A. Sabo
P. Sullivan
C. Thomas
J. Tucker

Task Group on ISI of Spent Nuclear Fuel Storage and Transportation Containment Systems (BPV XI)

K. Hunter, *Chair*
M. Orihuela, *Secretary*
D. J. Ammerman
W. H. Borter
J. Broussard
S. Brown
C. R. Bryan
T. Carraher
S. Corcoran
D. Dunn
N. Fales
R. C. Folley
G. Grant
B. Gutherman
M. W. Joseph
M. Keene
M. Liu
K. Mauskar
R. M. Meyer
B. L. Montgomery
R. M. Pace
E. L. Pleins
M. A. Richter
B. Sarno
R. Sindelar
M. Staley
J. Wellwood
X. J. Zhai
P.-S. Lam, *Alternate*
G. White, *Alternate*
J. Wise, *Alternate*
H. Smith, *Contributing Member*

Subgroup on Evaluation Standards (SG-ES) (BPV XI)

W. H. Bamford, *Chair*
N. A. Palm, *Secretary*
M. Brumovsky
H. D. Chung
R. C. Cipolla
C. M. Faidy
M. M. Farooq
B. R. Ganta
T. J. Griesbach
K. Hasegawa
K. Hojo
D. N. Hopkins
D. R. Lee
Y. S. Li
R. O. McGill
H. S. Mehta
K. Miyazaki
R. M. Pace
J. C. Poehler
S. Ranganath
D. A. Scarth
D. J. Shim
G. L. Stevens
A. Udyawar
T. V. Vo
G. M. Wilkowski
S. X. Xu
M. L. Benson, *Alternate*

Task Group on Evaluation of Beyond Design Basis Events (SG-ES) (BPV XI)

R. M. Pace, *Chair*
S. X. Xu, *Secretary*
F. G. Abatt
G. A. Antaki
P. R. Donavin
R. G. Gilada
T. J. Griesbach
M. Hayashi
K. Hojo
S. A. Kleinsmith
H. S. Mehta
T. V. Vo
G. M. Wilkowski
T. Weaver, *Contributing Member*

Working Group on Flaw Evaluation (SG-ES) (BPV XI)

R. C. Cipolla, *Chair*
S. X. Xu, *Secretary*
W. H. Bamford
M. L. Benson
M. Brumovsky
H. D. Chung
M. A. Erickson
C. M. Faidy
M. M. Farooq
B. R. Ganta
R. G. Gilada
F. D. Hayes
P. H. Hoang
K. Hojo
D. N. Hopkins
S. Kalyanam
Y. Kim
V. Lacroix
D. R. Lee
Y. S. Li
C. Liu
M. Liu
H. S. Mehta
G. A. A. Miessi
K. Miyazaki
S. Noronha
R. K. Qashu
S. Ranganath
P. J. Rush
D. A. Scarth
W. L. Server
D. J. Shim
S. Smith
M. Uddin
A. Udyawar
T. V. Vo
K. Wang
B. Wasiluk
G. M. Wilkowski

Working Group on Flaw Evaluation Reference Curves (BPV XI)

G. L. Stevens, *Chair*
A. Udyawar, *Secretary*
W. H. Bamford
M. L. Benson
F. W. Brust
R. C. Cipolla
M. M. Farooq
A. E. Freed
P. Gill
K. Hasegawa
K. Hojo
R. Janowiak
A. Jenks
V. Lacroix
H. S. Mehta
K. Miyazaki
B. Pellereau
S. Ranganath
D. A. Scarth
D. J. Shim
S. Smith
T. V. Vo
S. X. Xu

Working Group on Operating Plant Criteria (SG-ES) (BPV XI)

N. A. Palm, *Chair*
A. E. Freed, *Secretary*
K. R. Baker
W. H. Bamford
M. Brumovsky
M. A. Erickson
T. J. Griesbach
M. Hayashi
R. Janowiak
M. Kirk
S. A. Kleinsmith
H. Kobayashi
H. S. Mehta
A. D. Odell
R. M. Pace
J. C. Poehler
S. Ranganath
W. L. Server
C. A. Tomes
A. Udyawar
T. V. Vo
H. Q. Xu

Task Group on Appendix L (WG-OPC) (BPV XI)

N. Glunt, *Chair*
R. M. Pace, *Secretary*
A. E. Freed
M. A. Gray
T. J. Griesbach
H. Nam
A. Nana
A. D. Odell
C.-S. Oh
H. Park
S. Ranganath
D. J. Shim
S. Smith
G. L. Stevens
A. Udyawar

Working Group on Pipe Flaw Evaluation (SG-ES) (BPV XI)

D. A. Scarth, *Chair*
G. M. Wilkowski, *Secretary*
K. Azuma
M. L. Benson
M. Brumovsky
F. W. Brust
H. D. Chung
R. C. Cipolla
N. G. Cofie
C. M. Faidy
M. M. Farooq
B. R. Ganta
S. R. Gosselin
C. E. Guzman-Leong
K. Hasegawa
P. H. Hoang
K. Hojo
D. N. Hopkins
E. J. Houston
R. Janowiak
S. Kalyanam
K. Kashima
V. Lacroix
Y. S. Li
R. O. McGill
H. S. Mehta
G. A. A. Miessi
K. Miyazaki
S. H. Pellet
P. J. Rush
C. J. Sallaberry
W. L. Server
D. J. Shim
S. Smith
M. F. Uddin
A. Udyawar
T. V. Vo
K. Wang
B. Wasiluk
S. X. Xu

Task Group on Code Case N-513 (WG-PFE) (BPV XI)

R. O. McGill, *Chair*
E. J. Houston, *Secretary*
G. A. Antaki
R. C. Cipolla
M. M. Farooq
R. Janowiak
S. M. Parker
D. Rudland
P. J. Rush
D. A. Scarth
S. X. Xu

Task Group on Evaluation Procedures for Degraded Buried Pipe (WG-PFE) (BPV XI)

R. O. McGill, *Chair*
S. X. Xu, *Secretary*
F. G. Abatt
G. A. Antaki
R. C. Cipolla
R. G. Gilada
K. Hasegawa
K. M. Hoffman
R. Janowiak
M. Kassar
M. Moenssens
D. P. Munson
R. M. Pace
S. H. Pellet
D. Rudland
P. J. Rush
D. A. Scarth

Task Group on Flaw Evaluation for HDPE Pipe (WG-PFE) (BPV XI)

P. J. Rush, *Chair*
P. Krishnaswamy
M. Moenssens
D. P. Munson
D. A. Scarth
D. J. Shim
M. Troughton
J. Wright
S. X. Xu

Subgroup on Nondestructive Examination (SG-NDE) (BPV XI)

J. T. Lindberg, *Chair*
D. R. Cordes, *Secretary*
M. Briley
C. Brown
T. L. Chan
T. Cinson
S. E. Cumblidge
K. J. Hacker
J. Harrison
D. O. Henry
G. A. Lofthus
S. A. Sabo
F. J. Schaaf, Jr.
R. V. Swain
C. A. Nove, *Alternate*

Working Group on Personnel Qualification and Surface Visual and Eddy Current Examination (SG-NDE) (BPV XI)

C. Brown, *Chair*
T. Cinson, *Secretary*
J. E. Aycock
J. Bennett
S. E. Cumblidge
A. Diaz
N. Farenbaugh
D. O. Henry
J. T. Lindberg
C. Shinsky
R. Tedder
T. Thulien
J. T. Timm

Working Group on Procedure Qualification and Volumetric Examination (SG-NDE) (BPV XI)

G. A. Lofthus, *Chair*
J. Harrison, *Secretary*
M. Briley
A. Bushmire
D. R. Cordes
S. R. Doctor
K. J. Hacker
W. A. Jensen
D. A. Kull
C. Latiolais
C. A. Nove
S. A. Sabo
R. V. Swain
D. Van Allen
D. K. Zimmerman
B. Lin, *Alternate*

Subgroup on Repair/Replacement Activities (SG-RRA) (BPV XI)

S. L. McCracken, *Chair*
E. V. Farrell, Jr., *Secretary*
J. F. Ball
M. Brandes
S. B. Brown
R. Clow
P. D. Fisher
M. L. Hall
W. C. Holston
J. Honcharik
A. B. Meichler
B. R. Newton
S. A. Norman
J. E. O'Sullivan
G. C. Park
R. R. Stevenson
R. W. Swayne
D. J. Tilly
D. E. Waskey
J. G. Weicks
B. Lin, *Alternate*
J. K. Loy, *Alternate*

Working Group on Welding and Special Repair Processes (SG-RRA) (BPV XI)

J. G. Weicks, *Chair*
D. Barborak
S. J. Findlan
P. D. Fisher
R. C. Folley
M. L. Hall
W. C. Holston
J. Honcharik
C. C. Kim
M. Kris
S. E. Marlette
S. L. McCracken
B. R. Newton
J. E. O'Sullivan
D. J. Tilly
D. E. Waskey
J. K. Loy, *Alternate*

Task Group on Temper Bead Welding (BPV XI)

S. J. Findlan, *Chair*
D. Barborak
M. L. Hall
S. L. McCracken
N. Mohr
B. R. Newton
G. Olson
J. E. O'Sullivan
A. Patel
J. Tatman
D. J. Tilly
D. E. Waskey
J. G. Weicks

Task Group on Weld Overlay (BPV XI)

S. L. McCracken, *Chair*
D. Barborak
S. J. Findlan
M. L. Hall
W. C. Holston
S. Hunter
C. Lohse
S. E. Marlette
B. R. Newton
G. Olson
A. Patel
P. Raynaud
D. W. Sandusky
D. E. Waskey
J. G. Weicks

Working Group on Non-Metals Repair/Replacement Activities (SG-RRA) (BPV XI)

J. E. O'Sullivan, *Chair*
S. Schuessler, *Secretary*
M. Brandes
D. R. Dechene
J. Johnston, Jr.
B. Lin
M. P. Marohl
T. M. Musto
S. Patterson
A. Pridmore
F. J. Schaaf, Jr.
R. Stakenborghs

Task Group on HDPE Piping for Low Safety Significance Systems (WG-NMRRA) (BPV XI)

M. Brandes, *Chair*
J. E. O'Sullivan, *Secretary*
M. Golliet
B. Lin
T. M. Musto
F. J. Schaaf, Jr.
S. Schuessler
R. Stakenborghs

Task Group on Repair by Carbon Fiber Composites (WGN-MRR) (BPV XI)

J. E. O'Sullivan, *Chair*
S. F. Arnold
S. W. Choi
D. R. Dechene
M. Golliet
L. S. Gordon
M. Kuntz
H. Lu
M. P. Marohl
L. Nadeau
C. A. Nove
R. P. Ojdrovic
A. Pridmore
P. Raynaud
S. Rios
C. W. Rowley
J. Sealey
R. Stakenborghs
N. Stoeva
M. F. Uddin
J. Wen
B. Davenport, *Alternate*

Working Group on Design and Programs (SG-RRA) (BPV XI)

S. B. Brown, *Chair*
A. B. Meichler, *Secretary*
O. Bhatty
R. Clow
R. R. Croft
E. V. Farrell, Jr.
B. Lin
H. Malikowski
G. C. Park
M. A. Pyne
R. R. Stevenson
R. W. Swayne

Task Group on Repair and Replacement Optimization (WG-D&P) (BPV XI)

S. L. McCracken, *Chair*
T. Basso
R. Clow
K. Dietrich
E. V. Farrell, Jr.
R. C. Folley
M. L. Hall
W. C. Holston
D. Jacobs
H. Malikowski
T. Nuoffer
G. C. Park
A. Patel
R. R. Stevenson
R. G. Weicks

Subgroup on Water-Cooled Systems (SG-WCS) (BPV XI)

M. J. Ferlisi, *Chair*
J. Nygaard, *Secretary*
J. M. Boughman
S. B. Brown
S. T. Chesworth
H. Q. Do
K. W. Hall
P. J. Hennessey
K. M. Hoffman
A. E. Keyser
S. D. Kulat
D. W. Lamond
T. Nomura
T. Nuoffer
M. A. Pyne
H. M. Stephens, Jr.
R. Thames
M. Weis
M. J. Homiack, *Alternate*

Task Group on High Strength Nickel Alloys Issues (SG-WCS) (BPV XI)

H. Malikowski, *Chair*
K. Dietrich, *Secretary*
W. H. Bamford
T. Cinson
P. R. Donavin
K. M. Hoffman
H. Kobayashi
C. Lohse
S. E. Marlette
B. L. Montgomery
G. C. Park
W. Sims
D. E. Waskey
C. Wax
K. A. Whitney

Working Group on Containment (SG-WCS) (BPV XI)

M. J. Ferlisi, *Chair*
R. Thames, *Secretary*
P. S. Ghosal
H. T. Hill
A. E. Keyser
B. Lehman
P. Leininger
J. A. Munshi
M. Sircar
P. C. Smith
S. Walden
M. Weis
S. G. Brown, *Alternate*

Working Group on Inspection of Systems and Components (SG-WCS) (BPV XI)

H. Q. Do, *Chair*
M. Weis, *Secretary*
R. W. Blyde
K. Caver
C. Cueto-Felgueroso
M. J. Ferlisi
M. L. Garcia Heras
K. W. Hall
K. M. Hoffman
J. Howard
A. Keller
S. D. Kulat
E. Lantz
A. Maekawa
T. Nomura
J. C. Nygaard
S. Orita

Working Group on Pressure Testing (SG-WCS) (BPV XI)

J. M. Boughman, *Chair*
S. A. Norman, *Secretary*
T. Anselmi
B. Casey
Y.-K. Chung
M. J. Homiack
A. E. Keyser
D. W. Lamond
J. K. McClanahan
T. P. McClure
B. L. Montgomery
M. Moenssens
R. A. Nettles
C. Thomas

Working Group on Risk-Informed Activities (SG-WCS) (BPV XI)

M. A. Pyne, *Chair*
S. T. Chesworth, *Secretary*
G. Brouette
C. Cueto-Felgueroso
R. Haessler
J. Hakii
K. W. Hall
M. J. Homiack
S. D. Kulat
D. W. Lamond
G. J. Navratil
P. J. O'Regan
N. A. Palm
D. Vetter
J. C. Younger

Working Group on General Requirements (BPV XI)

T. Nuoffer, *Chair*
J. Mayo, *Secretary*
J. F. Ball
T. L. Chan
P. J. Hennessey
K. A. Kavanagh
T. N. Rezk
A. T. Roberts III
S. R. Scott
D. Vetter
S. E. Woolf
M. T. Audrain, *Alternate*
R. S. Spencer, *Alternate*

Subgroup on Reliability and Integrity Management Program (SG-RIM) (BPV XI)

A. T. Roberts III, *Chair*
D. Vetter, *Secretary*
T. Anselmi
N. Broom
V. Chugh
S. R. Doctor
J. D. Fletcher
J. T. Fong
J. Grimm
K. Harris
P. J. Hennessey
D. M. Jones
D. R. Lee
T. Lupold
M. Orihuela
F. J. Schaaf, Jr.
H. M. Stephens, Jr.
R. W. Swayne
S. Takaya
R. Vayda

Working Group on MANDE (BPV XI)

H. M. Stephens, Jr., *Chair*
S. R. Doctor, *Vice Chair*
M. Turnbow, *Secretary*
T. Anselmi
N. A. Finney
J. T. Fong
D. O. Henry
T. Lupold
L. E. Mullins
M. Orihuela

JSME/ASME Joint Task Group for System-Based Code (SWG-RIM) (BPV XI)

S. Takaya, *Chair*
T. Asayama
S. R. Doctor
K. Dozaki
J. T. Fong
J. Hakii
K. Harris
M. Hayashi
Y. Kamishima
D. R. Lee
H. Machida
T. Muraki
A. T. Roberts III
F. J. Schaaf, Jr.
R. Vayda
D. Watanabe
M. Morishita, *Contributing Member*

COMMITTEE ON TRANSPORT TANKS (BPV XII)

N. J. Paulick, *Chair*
M. D. Rana, *Vice Chair*
J. Oh, *Staff Secretary*
A. N. Antoniou
P. Chilukuri
W. L. Garfield
M. Pitts
J. Roberts
T. A. Rogers
R. C. Sallash
M. Shah
S. Staniszewski
A. P. Varghese
Y. Doron, *Contributing Member*
R. Meyers, *Contributing Member*
M. R. Ward, *Contributing Member*

Executive Committee (BPV XII)

M. D. Rana, *Chair*
N. J. Paulick, *Vice Chair*
J. Oh, *Staff Secretary*
M. Pitts
T. A. Rogers
R. C. Sallash
S. Staniszewski
A. P. Varghese

Subgroup on Design and Materials (BPV XII)

R. C. Sallash, *Chair*
D. K. Chandiramani
P. Chilukuri
Y. Doron
S. L. McWilliams
N. J. Paulick
M. D. Rana
T. A. Rogers
M. Shah
S. Staniszewski
A. P. Varghese
K. Xu
A. T. Duggleby, *Contributing Member*
R. D. Hayworth, *Contributing Member*
G. G. Karcher, *Contributing Member*
B. E. Spencer, *Contributing Member*
M. R. Ward, *Contributing Member*
J. Zheng, *Contributing Member*

Subgroup on Fabrication, Inspection, and Continued Service (BPV XII)

M. Pitts, *Chair*
P. Chilukuri
Y. Doron
M. Koprivnak
P. Miller
O. Mulet
J. Roberts
T. A. Rogers
R. C. Sallash
L. Selensky
S. Staniszewski
R. D. Hayworth
G. McRae, *Contributing Member*

Subgroup on General Requirements (BPV XII)

S. Staniszewski, *Chair*
B. F. Pittel, *Secretary*
A. N. Antoniou
Y. Doron
H. Ebben III
J. L. Freiler
W. L. Garfield
O. Mulet
M. Pitts
R. C. Sallash
L. Selensky
P. Chilukuri, *Contributing Member*
T. J. Hitchcock, *Contributing Member*
S. L. McWilliams, *Contributing Member*
T. A. Rogers, *Contributing Member*
D. G. Shelton, *Contributing Member*
M. R. Ward, *Contributing Member*

Subgroup on Nonmandatory Appendices (BPV XII)

T. A. Rogers, *Chair*
S. Staniszewski, *Secretary*
P. Chilukuri
N. J. Paulick
M. Pitts
R. C. Sallash
D. G. Shelton
Y. Doron, *Contributing Member*

COMMITTEE ON OVERPRESSURE PROTECTION (BPV XIII)

D. B. DeMichael, *Chair*
D. Miller, *Vice Chair*
C. E. O'Brien, *Staff Secretary*
J. F. Ball
J. Burgess
B. Calderon
J. W. Dickson
A. Donaldson
S. F. Harrison, Jr.
B. K. Nutter
T. Patel
M. Poehlmann
T. R. Tarbay
D. E. Tompkins
Z. Wang
J. A. West
A. Wilson
H. Aguilar, *Contributing Member*
R. W. Barnes, *Contributing Member*
R. D. Danzy, *Contributing Member*
M. Elias, *Contributing Member*
D. Felix, *Contributing Member*
A. Frigerio, *Contributing Member*
J. P. Glaspie, *Contributing Member*
A. Hassan, *Contributing Member*
P. K. Lam, *Contributing Member*
J. M. Levy, *Contributing Member*
M. Mengon, *Contributing Member*
J. Mize, *Contributing Member*
M. Mullavey, *Contributing Member*
S. K. Parimi, *Contributing Member*
R. Raman, *Contributing Member*
M. Reddy, *Contributing Member*
S. Ruesenberg, *Contributing Member*
K. Shores, *Contributing Member*
D. E. Tezzo, *Contributing Member*

Executive Committee (BPV XIII)

D. Miller, *Chair*
D. B. DeMichael, *Vice Chair*
C. E. O'Brien, *Staff Secretary*
J. F. Ball
A. Donaldson
B. K. Nutter
J. A. West

Subgroup on Design and Materials (BPV XIII)

D. Miller, *Chair*
T. Patel, *Vice Chair*
B. Mruk, *Secretary*
C. E. Beair
A. Biesecker
W. E. Chapin
J. L. Freiler
B. Joergensen
V. Kalyanasundaram
B. J. Mollitor
A. Swearingin
T. R. Tarbay
J. A. West
A. Williams
D. J. Azukas, *Contributing Member*
R. D. Danzy, *Contributing Member*
A. Hassan, *Contributing Member*
R. Miyata, *Contributing Member*
M. Mullavey, *Contributing Member*
S. K. Parimi, *Contributing Member*
G. Ramirez, *Contributing Member*
K. Shores, *Contributing Member*

Subgroup on General Requirements (BPV XIII)

A. Donaldson, *Chair*
B. F. Pittel, *Vice Chair*
J. M. Levy, *Secretary*
D. J. Azukas
J. F. Ball
M. Z. Brown
J. Burgess
D. B. DeMichael
M. Elias
S. T. French
J. Gillham
R. Klimas, Jr.
Z. E. Kumana
P. K. Lam
K. R. May
J. Mize
L. Moedinger
M. Mullavey
M. Poehlmann
K. Shores
D. E. Tezzo
D. E. Tompkins
J. F. White
B. Calderon, *Contributing Member*
P. Chavdarov, *Contributing Member*
T. M. Fabiani, *Contributing Member*
J. L. Freiler, *Contributing Member*
J. P. Glaspie, *Contributing Member*
G. D. Goodson, *Contributing Member*
C. Haldiman, *Contributing Member*
J. Horne, *Contributing Member*
B. Joergensen, *Contributing Member*
C. Lasarte, *Contributing Member*
D. Mainiero-Cessna, *Contributing Member*
M. Mengon, *Contributing Member*
D. E. Miller, *Contributing Member*
R. Miyata, *Contributing Member*
B. Mruk, *Contributing Member*
R. Raman, *Contributing Member*
M. Reddy, *Contributing Member*
S. Ruesenberg, *Contributing Member*
R. Sadowski, *Contributing Member*
A. Swearingin, *Contributing Member*
A. P. Varghese, *Contributing Member*

Subgroup on Nuclear (BPV XIII)

J. F. Ball, *Chair*
K. R. May, *Vice Chair*
R. Krithivasan, *Secretary*
J. W. Dickson
S. Jones
R. Lack
D. Miller
T. Patel
K. Shores
I. H. Tseng
J. Yu
N. J. Hansing, *Alternate*
J. M. Levy, *Alternate*
B. J. Yonsky, *Alternate*
S. T. French, *Contributing Member*
D. B. Ross, *Contributing Member*

Subgroup on Testing (BPV XIII)

B. K. Nutter, *Chair*
T. P. Beirne, *Vice Chair*
J. W. Dickson, *Secretary*
B. Calderon
V. Chicola III
B. Engman
R. J. Garnett
R. Houk
R. Lack
M. Mengon
C. Sharpe
A. Strecker
J. R. Thomas, Jr.
Z. Wang
A. Wilson
D. Nelson, *Alternate*
J. Cockerham, *Contributing Member*
J. Mize, *Contributing Member*
M. Mullavey, *Contributing Member*
R. Raman, *Contributing Member*
S. Ruesenberg, *Contributing Member*
K. Shores, *Contributing Member*

US TAG to ISO TC 185 Safety Devices for Protection Against Excessive Pressure (BPV XIII)

D. Miller, *Chair*
C. E. O'Brien, *Staff Secretary*
J. F. Ball
T. J. Bevilacqua
D. B. DeMichael
J. W. Dickson
B. K. Nutter
T. Patel
J. R. Thomas, Jr.
J. A. West
J. F. White

COMMITTEE ON BOILER AND PRESSURE VESSEL CONFORMITY ASSESSMENT (CBPVCA)

R. V. Wielgoszinski, *Chair*
G. Scribner, *Vice Chair*
P. Murray, *Staff Secretary*
J. P. Chicoine
P. D. Edwards
T. E. Hansen
B. L. Krasiun
P. F. Martin
L. E. McDonald
D. Miller
I. Powell
L. Skarin
R. Uebel
E. A. Whittle
P. Williams
T. P. Beirne, *Alternate*
M. Blankinship, *Alternate*
J. W. Dickson, *Alternate*
J. M. Downs, *Alternate*
B. J. Hackett, *Alternate*
W. Hibdon, *Alternate*
Y.-S. Kim, *Alternate*
B. Morelock, *Alternate*
M. Poehlmann, *Alternate*
R. Rockwood, *Alternate*
B. C. Turczynski, *Alternate*
D. E. Tuttle, *Alternate*
S. V. Voorhees, *Alternate*
D. Cheetham, *Contributing Member*
A. J. Spencer, *Honorary Member*

COMMITTEE ON NUCLEAR CERTIFICATION (CNC)

R. R. Stevenson, *Chair*
J. DeKleine, *Vice Chair*
Z. McLucas, *Staff Secretary*
J. F. Ball
G. Claffey
G. Gobbi
S. M. Goodwin
J. W. Highlands
K. A. Kavanagh
J. C. Krane
M. A. Lockwood
T. McGee
E. L. Pleins
T. E. Quaka
T. N. Rezk
G. E. Szabatura
C. Turylo
D. M. Vickery
E. A. Whittle
T. Aldo, *Alternate*
M. Blankinship, *Alternate*
P. J. Coco, *Alternate*
N. DeSantis, *Alternate*
C. Dinic, *Alternate*
P. D. Edwards, *Alternate*
T. B. Franchuk, *Alternate*
K. M. Hottle, *Alternate*
P. Krane, *Alternate*
D. Nenstiel, *Alternate*
L. Ponce, *Alternate*
P. F. Prescott, *Alternate*
S. V. Voorhees, *Alternate*
M. Wilson, *Alternate*
S. Yang, *Alternate*
S. F. Harrison, Jr., *Contributing Member*

SUMMARY OF CHANGES

Errata to the BPV Code may be posted on the ASME website 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.

Changes given below are identified on the pages by a margin note, **(21)**, placed next to the affected area.

Page	*Location*	*Change*
xv	List of Sections	*(1)* Listing for Section III updated *(2)* Section XIII added *(3)* Code Case information updated
xvii	Foreword	*(1)* Subparagraph (k) added and subsequent subparagraph redesignated *(2)* Second footnote revised *(3)* Last paragraph added
xx	Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees	Paragraphs 1(a)(3)(-b), 2(b), and 5(a)(3) revised
xxiii	Personnel	Updated
1	KG-103	Revised
2	KG-116	Revised
2	KG-120	Revised
2	KG-121	Title and first paragraph revised
3	KG-141	In subpara. (a), last bulleted item added
4	Table KG-141	Revised
3	KG-150	In subpara. (e), last line revised
6	KG-210	Subparagraph (e) revised
8	KG-311.11	In last line, cross-reference updated
8	KG-311.12	Subparagraph (i) added
16	KG-510	Cross-references updated
16	KG-516	Last cross-reference updated
17	KG-522	Last cross-reference updated
18	KG-611	Third cross-reference updated
18	KG-613	Subparagraph (a) and first line of subpara. (c) revised
19	KM-100	Subparagraph (a) and first line of subpara. (c) revised
23	KM-211.1	In subpara. (b), last line revised
23	KM-211.2	Subparagraphs (a), (b), and (c) revised
24	KM-211.3	Subparagraph (b) revised

Page	*Location*	*Change*
27	KM-234.1	In subpara. (b), second cross-reference updated
29	KM-252	Revised
29	KM-253	Revised
30	KM-261	First paragraph revised
31	KM-304	Cross-reference updated
32	KM-400	Subparagraph (a)(4) added and subpara. (b) revised
33	Table KM-400-1	*(1)* For Carbon Steel, SA-738, UNS No. revised *(2)* For Carbon Steel, SA-841, Type/Grade A and B, thickness revised *(3)* For 1Cr–$\frac{1}{2}$Mo–V, SA-193, UNS No. K14072, Specified Min. Tensile 100, thickness revised *(4)* Entries for $\frac{3}{4}$Ni–1Cu–$\frac{3}{4}$Cr, SA-736, Type/Grade A, entries for Specified Min. Tensile 90, 72, and 65 deleted *(5)* Note (16) revised
39	Table KM-400-1M	*(1)* For Carbon Steel, SA-738, UNS No. revised *(2)* For Carbon Steel, SA-841, Type/Grade A, thickness and specified min. tensile revised; for Type/Grade B, thickness revised *(3)* For C–$\frac{1}{4}$Mo, SA-320, thickness revised *(4)* For 1Cr–$\frac{1}{5}$Mo, SA-193 Type/Grade B7, SA-320 Type/Grade L7M, SA-320 Type/Grade L7, thickness revised *(5)* For 1Cr–$\frac{1}{4}$Mo–V, SA-193, UNS No. K14072, Specified Min. Tensile 690, thickness revised *(6)* For 1$\frac{3}{4}$Cr–$\frac{1}{2}$Mo–Ti, SA-517, UNS No. K21604, Specified Min. Tensile 725 and 795, thickness revised *(7)* For $\frac{3}{4}$Ni–$\frac{1}{2}$Cr–$\frac{1}{2}$Mo–V, SA-517, K11576, thickness revised *(8)* Entries for $\frac{3}{4}$Ni–1Cu–$\frac{3}{4}$Cr, SA-736, Type/Grade A, entries deleted for specified min. tensile 620, 495, and 450 *(9)* For 1$\frac{1}{4}$Ni–1Cr–$\frac{1}{2}$Mo, SA-517, K21650, thickness revised *(10)* Note (16) revised
46	Table KM-400-2	*(1)* Notes (11) and (12) added and entries in Notes column updated *(2)* In Notes (6) and (8), cross-references updated
49	Table KM-400-2M	*(1)* Notes (11) and (12) added and entries in Notes column updated *(2)* In Notes (6) and (8), cross-references updated
56	KM-620	In first paragraph, first line revised
56	KM-630	Cross-references updated
57	Table KM-620	In second column, entries editorially revised
64	KD-131	Subparagraph (b) revised
65	KD-200	Subparagraphs (d) and (e) revised
65	KD-210	*(1)* Subparagraph (c) added and subsequent subparagraphs redesignated *(2)* Subparagraph (o) deleted
71	Table KD-230.2	Second entry added
69	KD-231.2	*(1)* Subparagraph (b) revised *(2)* Paragraph below subpara. (b)(4) revised
71	Table KD-230.3	In first column, last entry corrected by errata from “143” to “1.43”
69	KD-231.3	In Step 3, second sentence revised

Page	*Location*	*Change*
72	Table KD-230.4	Revised
71	KD-232.1	*(1)* Subparagraph (a) revised *(2)* In subpara. (e), definition of $\sigma_{e,k}$ revised in nomenclature
74	KD-234.1	In Step 3, second sentence revised
75	KD-240	*(1)* Subparagraph (d) revised in its entirety *(2)* In subpara. (e), second and third lines revised
78	KD-312.4	In subpara. (b), "$\sigma_{nm\ ij} < 0$" revised to "$\sigma_{nm\ ij} \leq 0$"
81	KD-330	Subparagraph (a) revised and subpara. (f) deleted in its entirety
82	KD-341	In Step 3, second sentence revised
86	KD-354.1	*(1)* In Step 5, last sentence revised *(2)* In Step 7, first line revised
87	KD-372	In subpara. (b), second sentence revised
90	Table KD-320.1	*(1)* Entry for Figure 320.3 revised *(2)* General Note (d)(5) deleted and subsequent notes redesignated *(3)* Note (1) added
93	Table KD-320.1M	*(1)* Entry for Figure 320.3M revised *(2)* General Note (d)(5) deleted and subsequent notes redesignated *(3)* Note (1) added
97	Figure KD-320.3	Revised
98	Figure KD-320.3M	Revised
100	Figure KD-320.4M	Editorially revised
102	Figure KD-320.5M	Editorially revised
110	KD-401	Subparagraphs (a) and (c) revised
110	KD-412	Revised
110	KD-412.1	Subparagraph (b) revised
111	KD-412.2	Subparagraph (c) revised
111	KD-430	*(1)* In subpara. (b)(2), third paragraph, definition of ΔK_{th} corrected by errata *(2)* In subpara. (d), definitions of C_o and m revised in nomenclature
112	KD-440	*(1)* In first paragraph, first sentence revised *(2)* In second paragraph, second sentence revised
112	Table KD-430	Title and second column head revised
112	Table KD-430M	Title and second column head revised
117	KD-601	Subparagraph (d) revised
117	KD-623	Subparagraphs (b), (d), (f), and (g) revised
118	KD-631	Revised
121	KD-700	In subpara. (d)(1), fourth line revised
123	KD-723	Revised
125	KD-811.1	In second equation, first denominator E_i revised to E_I
131	Figure KD-830.4	Revised

Page	*Location*	*Change*
132	Figure KD-830.5	Illustrations (c) and (d) revised
137	KD-922	Revised
145	KD-1110	Fourth cross-reference updated
157	KD-1270	Subparagraph (a)(2) revised
158	KD-1310	*(1)* In subpara. (c), last cross-reference updated *(2)* In subpara. (h), first and second sentences, last cross-reference updated
159	KD-1311	Last cross-reference updated
163	KF-201	In subpara. (a), first line revised
181	KF-821	*(1)* Subparagraph (f) revised *(2)* Subparagraph (g) deleted and last two paragraphs added
184	Figure KF-822(b)	Editorially revised
184	KF-825.4	Subparagraph (b) revised
185	Figure KF-825.4	Former Figure KF-826.4(a) redesignated and revised
185	Figure KF-825.4(b)	Deleted
186	KF-826	*(1)* New designator KF-826.1 added and subparas. (c)(1), (c)(2), and (c)(3) revised *(2)* KF-826.2 added
193	KF-1211	In third sentence, cross-reference updated
193	KF-1212	*(1)* In subpara. (a), cross-references updated *(2)* In subpara. (b)(2), first sentence, last cross-reference updated
195	Part KR	Revised in its entirety
196	Part KOP	Added
204	KE-112.1	Revised in its entirety
230	KE-503	*(1)* Subparagraph (b) revised *(2)* In subpara. (b)(2), cross-references to Section X updated
232	KT-230	Revised
237	KT-510	Subparagraph (a) revised
238	KS-100	Subparagraph (b) revised
239	KS-120	*(1)* Subparagraph (b) revised *(2)* Subparagraph (c) merged with subpara. (b)
241	KS-200	Revised
241	KS-230	Revised
241	KS-240	Revised
241	KS-250	Subparagraph (c) deleted and subpara. (d) redesignated as (c)
244	1-100	*(1)* Definitions of A, C, C_o, CTOD, CVN, d_s, F_i, M, mnΔS_{range}, n, P, P_T, S, S_{alt}, S_y, W, Z, α, σ_e revised *(2)* Definitions of C_M, C_T, E_B, E_C, J_{crit}, $K_{c\delta}$, K_{Jc}, k_{c1}, P_O, S_i, S_M, S_T, δ_{crit}, added *(3)* Definitions of J_{Ic}, K_D, K_{uteq}, L_d, P_B, W_a, W_T, ρ deleted

Page	*Location*	*Change*
252	Mandatory Appendix 2	2-100, 2-110(c), 2-112, 2-113, 2-114, 2-118, 2-120, 2-121, and 2-124 revised
255	5-100	Revised
266	Mandatory Appendix 9	*(1)* 9-100, 9-200, 9-210, 9-220, 9-250, 9-260, 9-270, 9-300 revised *(2)* Former Figure 9-200-1 redesignated as Figure 9-200.1 and revised *(3)* 9-110 and Table 9-100.1 added
278	Form K-4	Deleted
278	Table A-100.2	Deleted
279	Form K-5	Deleted
279	Table A-100.3	Deleted
296	D-600	Deleted
298	E-210	Revised
299	E-222	Subparagraph (a) revised
315	Figure H-101	Note (1) revised
325	K-110	Definition of T_o revised
325	K-200	*(1)* Subparagraphs (f) and (g) merged and revised *(2)* Subparagraphs (h) and (i) resdesignated as (g) and (h), respectively, and revised
326	Figure K-200-2	Revised
327	Nonmandatory Appendix L	Deleted. Refer to ASME Section VIII, Division 2, Annex 5-A.
328	Nonmandatory Appendix M	Added

LIST OF CHANGES IN RECORD NUMBER ORDER

DELETED

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).

PART KG
GENERAL REQUIREMENTS

ARTICLE KG-1
SCOPE AND JURISDICTION

KG-100 SCOPE

KG-101 INTENT

The rules of this Division constitute requirements for the design, construction, inspection, and overpressure protection of metallic pressure vessels with design pressures generally above 10 ksi (70 MPa). However, it is not the intent of this Division to establish maximum pressure limits for either Section VIII, Division 1 or 2, nor minimum pressure limits for this Division. Specific pressure limitations for vessels constructed to the rules of this Division may be imposed elsewhere in this Division for various types of fabrication. Whenever *Construction* appears in this document, it may be considered an all-inclusive term comprising materials, design, fabrication, examination, inspection, testing, certification, and pressure relief.

KG-102 DESCRIPTION

Pressure vessels within the scope of this Division are pressure containers for the retainment of fluids, gaseous or liquid, under pressure, either internal or external.

This pressure may be generated by

(a) an external source

(b) the application of heat from

(1) direct source

(2) indirect source

(c) a process reaction

(d) any combination thereof

(21) #### KG-103 LAWS OR REGULATIONS

The scope of this Division has been established to identify components and parameters considered in formulating the rules given in this Division. Laws or regulations issued by municipal, state, provincial, federal, or other enforcement or regulatory bodies having jurisdiction at the location of an installation establish the mandatory applicability of the Code rules, in whole or in part, within the jurisdiction. Those laws or regulations may require the use of this Division for vessels or components not considered to be within its scope. These laws or regulations should be reviewed to determine size or service limitations of the coverage, which may be different or more restrictive than those of this Division.

KG-104 LOCATION

KG-104.1 Fixed Location. Except as provided in KG-104.2, these rules cover vessels to be installed at a fixed (stationary) location for a specific service where operation and maintenance control are maintained in conformance with the User's Design Specification and records retained during the life of the vessel by the User.

KG-104.2 Mobile Vessels. These rules also apply to pressure vessels that are relocated from work site to work site between pressurizations, and where operation and maintenance control are maintained in conformance with the User's Design Specification and records retained during the life of the vessel by the User.

KG-105 DIRECT FIRED

Pressure vessels which are subject to direct firing and are not within the scope of Section I may be constructed to the rules of this Division, except as excluded by KG-120.

KG-110 GEOMETRIC SCOPE OF THIS DIVISION

The scope of this Division includes only the vessel and integral communicating chambers and shall include the following (KG-111 through KG-117).

KG-111 EXTERNAL PIPING AND JACKETS

Where external piping is to be connected to the vessel (see Article KD-6):

(a) the first threaded joint for screwed connections

(b) the face of the first flange for flanged connections