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An ASME Company

ASME BOILER & PRESSURE VESSEL CODE

ASME presentation outlining key changes

2023

Today's Speakers and Moderators



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ASME

ASME's Codes and Standards are used and developed throughout the world by enterprises of all sizes, ranging from small- and medium-size businesses, in developed and developing nations, to large, multi-national corporations.

- Manufacturers
- Facility owners
- Plant operators
- Designers
- Constructors
- Inspection bodies
- Insurers
- Research institutes
- Local and national government



ASME's Worldwide Locations

- | | |
|---------------------|------------------|
| 1. New York, NY | 4. Houston, TX |
| 2. Little Falls, NJ | 5. Delhi, India |
| 3. Washington D.C. | 6. Beijing China |

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ASME Codes & Standards

- ASME's Standards are produced by 4 internal development boards
- Below are just a few of the many standards that run across these areas:

Standardization & Testing

- Y14 Engineering Drawings and Related Documents
- EA Industrial Energy Assessment Standards Committee
- Performance Test Codes

Nuclear

- Nuclear Codes and Standards, Sections III & XI
- Standards Committee on Cranes for Nuclear Facilities

Pressure Technology

- BPVC Sections I, II, IV, V, VIII, IX, X, XII, XIII
- B31 International Piping Code
- Bioprocessing Equipment (BPE)

Safety

- A17 Elevators and Escalators
- B20 Safety Standards for Conveyors and Related Equipment
- CSD Controls and Safety Devices for Automatically Fired Boilers
- Rail Transit Vehicle Standard Committee

2023 ASME Boiler & Pressure Vessel Code

- ASME Boiler Code was first published in 1914 with 114 pages
- The 2021 Edition consists of 13 Sections, containing 32 Volumes with more than 19,000 pages.
- The Boiler Code is divided into three broad groups:
 - Construction Codes
 - Nuclear Components and Nuclear In-service Inspection Codes
 - Service Codes
- The Boiler and Pressure Vessel Codes are published on a two-year cycle with a July 1, 20XX publication date
- The next edition will be published on July 1, 2023
- The content for the Boiler Code is developed by volunteers using a consensus-based process that is managed by our ASME Staff Engineers.



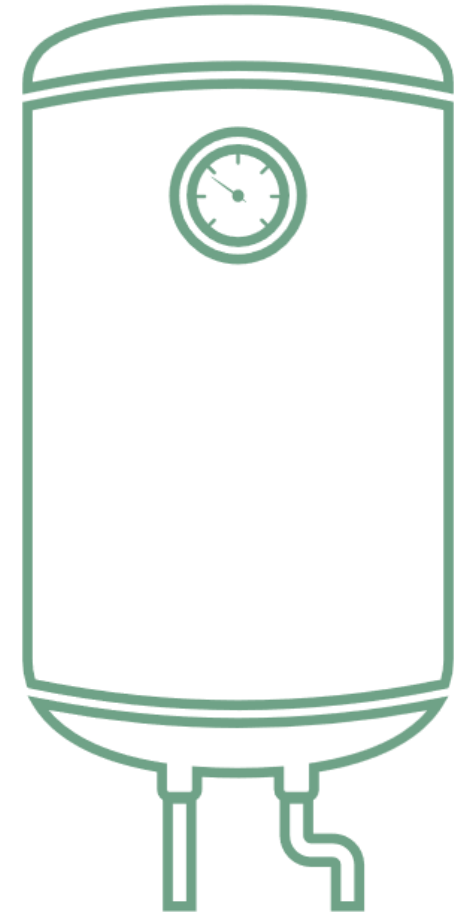
Non-Nuclear BPVC Sections

- Section I Rules for Construction of Power Boilers
- Section IV Rules for Construction of Heating Boilers
- Section VI Recommended Rules for the Care and Operation of Heating Boilers
- Section VII Recommended Guidelines for the Care of Power Boilers
- Section VIII Rules for Construction of Pressure Vessels
- Section X Fiber-Reinforced Plastic Pressure Vessels
- Section XII Rules for Construction and Continued Service of Transport Tanks



Boiler Sections

- Section I – Rules for Construction of Power Boilers
- Section IV – Rules for Construction of Heating Boilers
- Section VI – Recommended Rules for the Care and Operation of Heating Boilers
- Section VII – Recommended Guidelines for the Care of Power Boilers

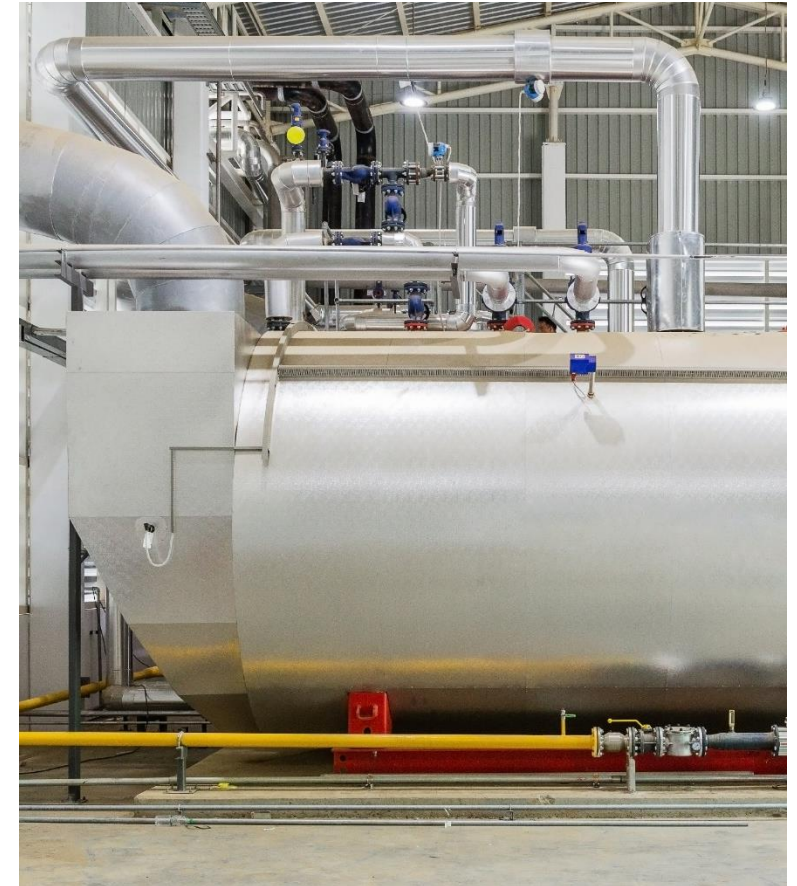


Section I – Rules for Construction of Power Boilers

Section I provides requirements for all methods of construction of power, electric, and miniature boilers; high temperature water boilers used in stationary service; and power boilers used in:

- Locomotive
- Portable
- Traction service

The rules are applicable to boilers in which steam or other vapor is generated at pressures exceeding 15 psig and high-temperature-water boilers intended for operation at pressures exceeding 160 psig and/or temperatures exceeding 250° Fahrenheit.



Section IV – Rules for Construction of Heating Boilers

Section IV provides requirements for the design, fabrication, installation, and inspection of steam heating, hot water heating, hot water supply boilers, and potable water heaters that are intended for low-pressure service and are directly fired by oil, gas, electricity, coal, or other solid or liquid fuels.

Section IV contains appendices that cover:

- Definitions relating to boiler design and welding
- Quality control systems
- Methods along with examples of
 - Checking safety-valve and safety-relief-valve capacity
 - Calculation and computation

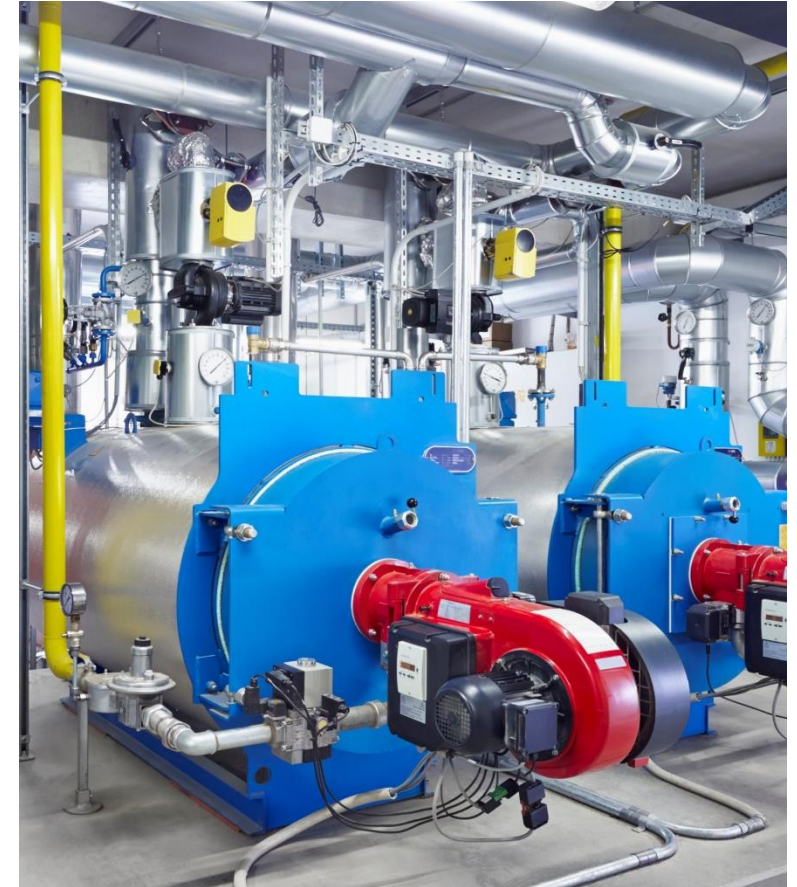


Section VI – Recommended Rules for the Care and Operation of Heating Boilers

This Section covers general descriptions, terminology, and operation guidelines applicable to steam heating, hot-water heating, hot-water supply, cast iron, and potable water boilers that are limited to the operating ranges of Section IV Heating Boilers.

Section VI includes:

- Guidelines for associated controls and automatic fuel burning equipment
- Illustrations showing typical examples of available equipment
- A glossary of terms commonly associated with boilers, controls, and fuel burning equipment

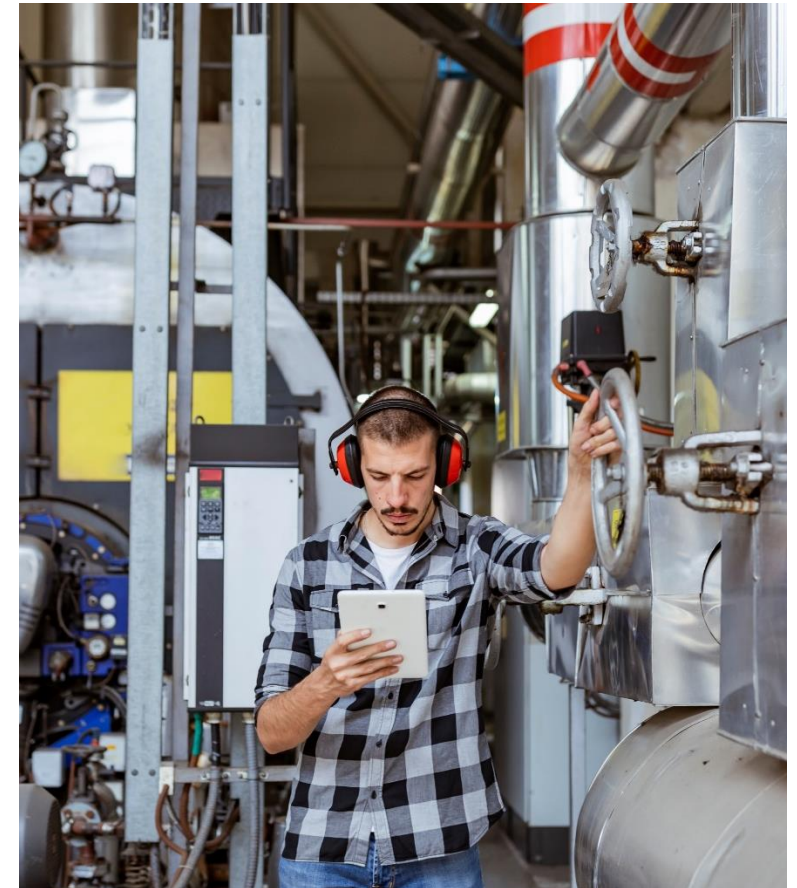


Section VII – Recommended Guidelines for the Care of Power Boilers

This Section provides recommended guidelines to promote safety in the use of power boilers. The term “power boiler”, in this Section, includes stationary, portable, and traction-type boilers, but does not include locomotive and high-temperature-water boilers, nuclear power-plant boilers, heating boilers, pressure vessels, or marine boilers. Emphasis has been placed on industrial type boilers because of their extensive use.

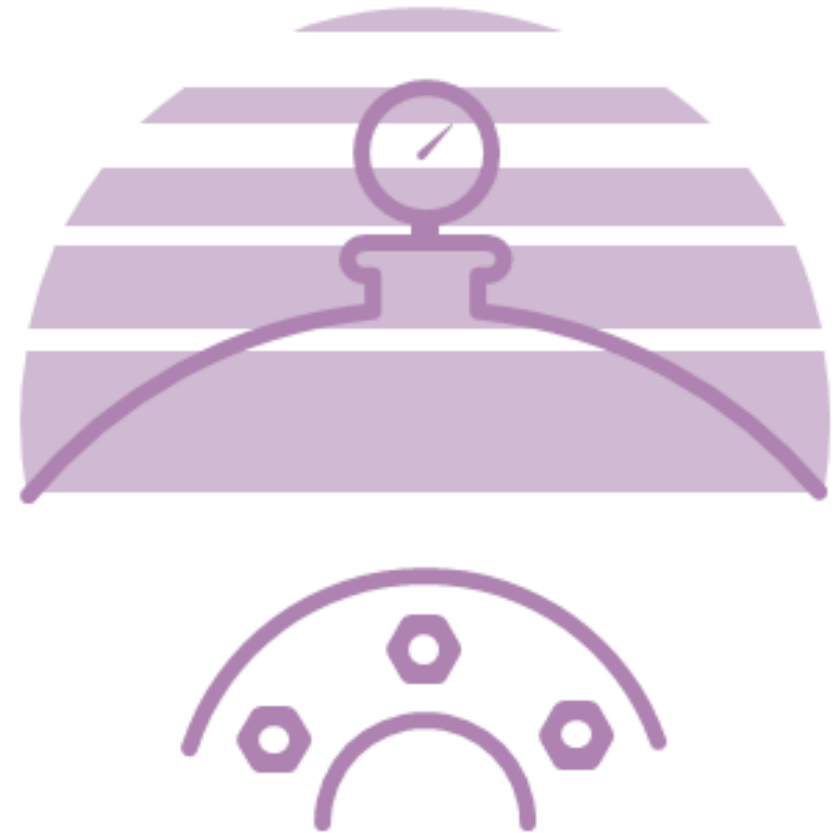
Section VII includes:

- Guidelines to assist those directly responsible for operating, maintaining, and inspecting power boilers.
- Operation of auxiliary equipment and appliance guidelines that affect the safe and reliable operation of power boilers.



Pressure Vessel Sections

- Section VIII – Rules for Construction of Pressure Vessels
- Section X – Fiber-Reinforced Plastic Pressure Vessels
- Section XII – Rules for Construction and Continued Service of Transport Tanks



Section VIII – Rules for Construction of Pressure Vessels, Division 1

Division 1 is very important from a design perspective because of the compulsory requirements, specific prohibitions, and impulsive, guidelines for materials, design, fabrication, inspection, and testing, markings and reports, overpressure protection, and certification of pressure vessels having an indoor or external pressure more than 15 psi (100 kPa)

This Division isn't numbered within the traditional method (Part 1, Part 2, etc.) but is structured with Subsections and Parts, which contains letters followed by variety.

“Design-by-Rule” philosophy



Section VIII – Rules for Construction of Pressure Vessels, Division 2, Alternative Rules

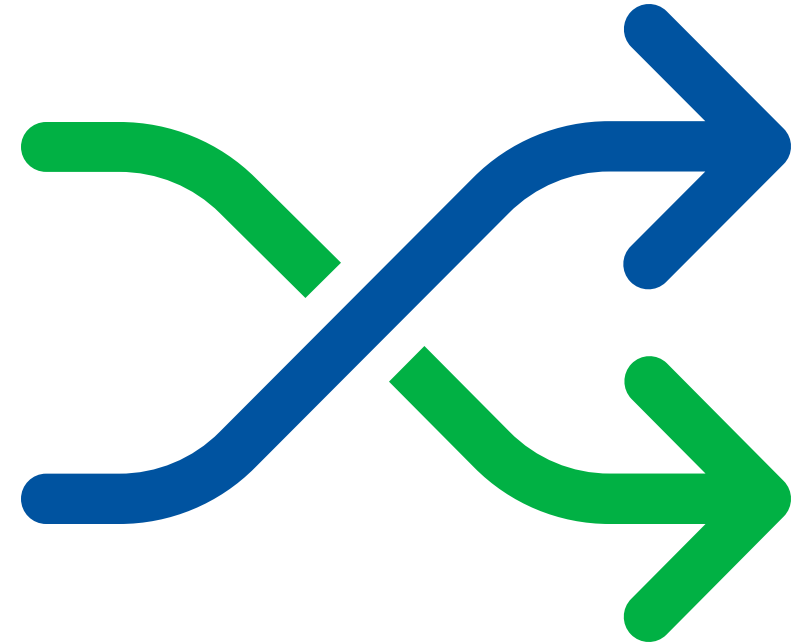
- Division 2 provides requirements applicable to the design, fabrication, inspection, testing, and certification of pressure vessels operating at either internal or external pressures exceeding 15 psig.
- This pressure may be obtained from an external source or by the application of heat from a direct or indirect source, or any combination thereof.
- These rules provide an alternative to the minimum requirements for pressure vessels under Division 1 rules. These rules may also apply to human occupancy pressure vessels, typically in the diving industry.
- Both “Design-by-Rule” and “Design-by-Analysis” (a methodical approach for demonstrating the adequacy of a pressure vessel component design, which provides detailed rules for performing analyses) philosophy



Section VIII – Rules for Construction of Pressure Vessels, Differences Between Divisions 1 and 2

- ASME Section VIII, Division 2 is intended for purpose-specific vessels with a defined fixed location.
- Another major difference between the Division 1 and Division 2 lies in failure theory. While Division 1 is based on normal stress theory, Division 2 is based on maximum distortion energy.

Von Mises Distortion Energy Theory (1913). In this theory, failure by yielding occurs when at any point in the body, the distortion energy per unit volume in a state of combined stress becomes equal to that associated with yielding in a simple tension test.



Section VIII – Rules for Construction of Pressure Vessels, Division 3, Alternative Rules for Construction of High Pressure Vessels

- Provides requirements applicable to the design, fabrication, inspection, testing, and certification of pressure vessels operating at either internal or external pressures, generally above 10,000 psi.
- Division 3 rules cover vessels intended for a specific service and installed in a fixed location or relocated from work site to work site between pressurizations.
- Division 3 does not establish maximum pressure limits for Section VIII, Divisions 1 or 2.



Section X – Fiber-Reinforced Plastic Pressure Vessels

This Section provides requirements for the construction of a fiber-reinforced plastic (FRP) pressure vessel in conformance with a manufacturer's design report.

- Includes production, processing, fabrication, inspection and testing methods required for the vessel.
- Speaks to three Classes of vessel design:
 - Class I and Class III - qualification through the destructive test of a prototype
 - Class II - mandatory design rules and acceptance testing by nondestructive methods.
- These vessels are not permitted to store, handle or process lethal fluids.
- Vessel fabrication is limited to the following processes: bag-molding, centrifugal casting and filament-winding and contact molding.



Section XII – Rules for Construction and Continued Service of Transport Tanks

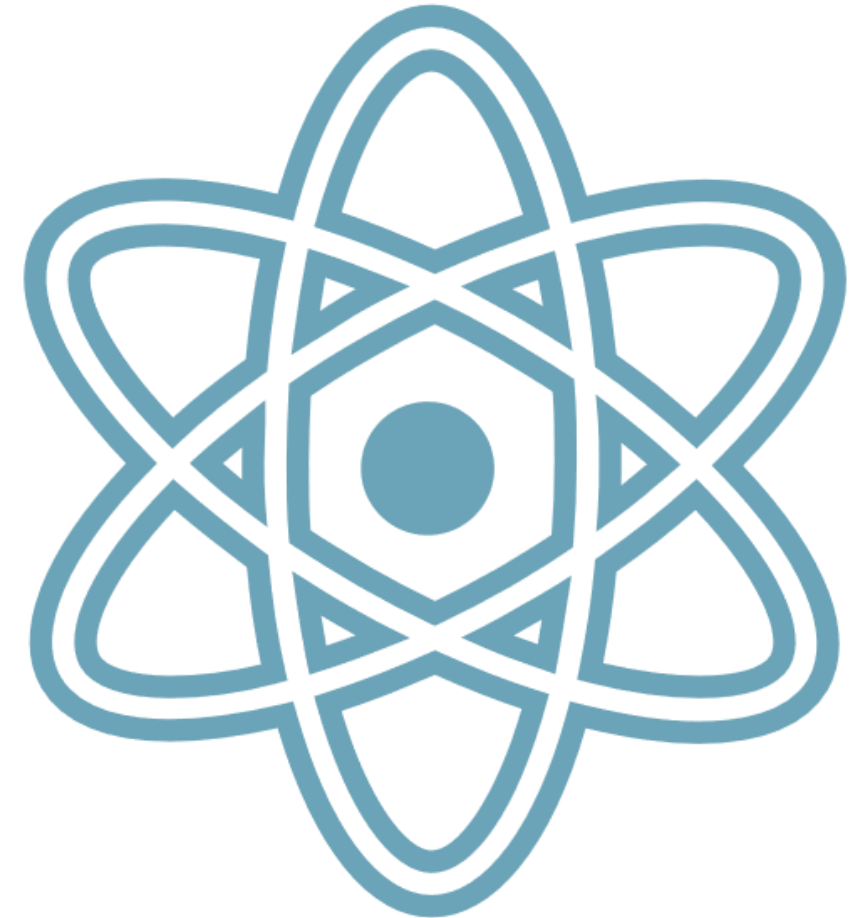
This Section covers requirements for construction and continued service of pressure vessels for the transportation of dangerous goods via highway, rail, air, or water at pressures from full vacuum to 3,000 psig and volumes greater than 120 gallons.

- "Construction" is an all-inclusive term comprising materials, design, fabrication, examination, inspection, testing, certification, and over-pressure protection.
- "Continued service" is an all-inclusive term referring to inspection, testing, repair, alteration, and recertification of a transport tank was in service.
- This Section contains modal appendices containing requirements for vessels used in specific transport modes and service applications.



Nuclear Sections

- Section III – Rules for Construction of Nuclear Facility Components
- Section XI – Rules for Inservice Inspection of Nuclear Reactor Facility Components



Section III – Rules for Construction of Nuclear Facility Components

- Subsection NCA – General requirements for Divisions 1 and 2
- Appendices – Mandatory and non-mandatory appendices referenced by all Divisions of Section III
- Division 1 – Requirements for Class 1, 2, 3, and MC Components, Supports, and Core Support Structures
 - Subsection NB – Class 1 Components
 - Subsection NCD – Class 2 and 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 and Transport Packaging
- Division 4 – Fusion Energy Devices
- Division 5 – High Temperature Reactors



Section XI – Rules for Inservice Inspection of Nuclear Reactor Facility Components

Provides requirements to maintain the nuclear power plant or nuclear reactor facility while in operation and to return the plant or facility to service following outages.

- **Division 1 Rules for Inspection and Testing of Components of Light-Water-Cooled Plants:**

Rules for the examination, inspection, and testing; NDE methods, qualifications, and requirements; evaluation and acceptance standards for flaws, defects, and relevant conditions; repair/replacement processes and correction actions/measures in light water-cooled nuclear power plants.

- **Division 2 Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Reactor Facilities:**

Provides requirements for the creation of the Reliability and Integrity Management Program, which addresses the entire lifecycle of a facility for all types of nuclear reactor facilities, including advanced nuclear reactor designs.



Service & Reference Sections

- Section II – Materials
- Section V – Nondestructive Examination
- Section IX – Welding, Brazing, and Fusing Qualifications
- Section XIII – Rules for Overpressure Protection



Service & Reference Sections

- Section II Materials
 - Provides material specifications and material properties adequate for safety in the field of pressure equipment for ASME construction that is referenced by the other BPVC sections.
- Section V Nondestructive Examination
 - Provides requirements and methods for nondestructive examination (NDE) to detect surface and internal imperfections in materials, welds, fabricated parts, and components. They include radiographic examination, ultrasonic examination, liquid penetrant examination, magnetic particle examination, eddy current examination, visual examination, leak testing, and acoustic emission examination.
- Section IX Welding, Brazing and Fusing Qualifications
 - Provides requirements relating to the qualification of welding, brazing, and fusing procedures including rules relating to the qualification and requalification of welders and brazers.



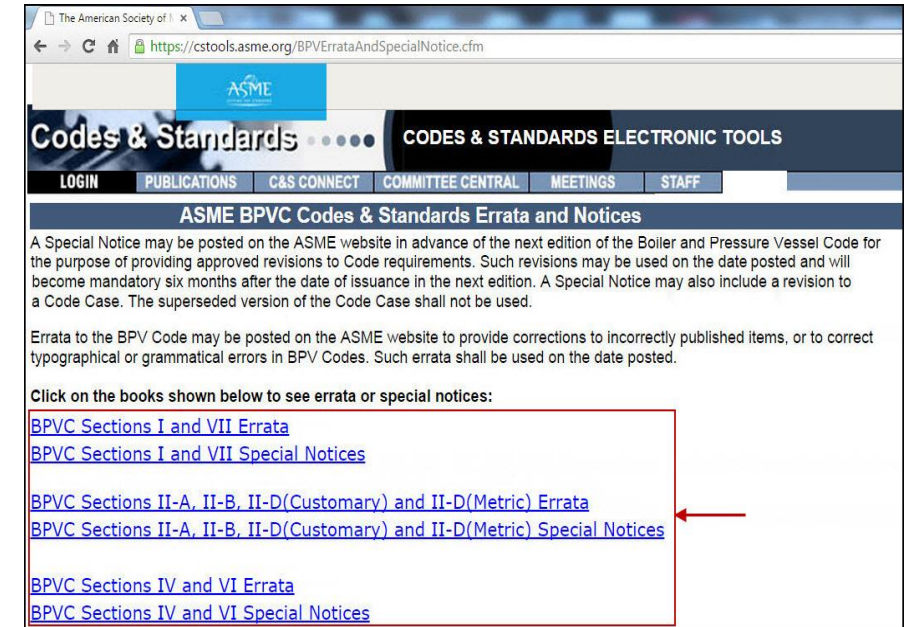
Section XIII – Rules for Overpressure Protection

- Provides rules for the overpressure protection of pressurized equipment such as boilers, pressure vessels, and piping systems.
- Provides clear pressure integrity and performance requirements, enabling users to identify a pressure relief device's performance along with anything needed to support overpressure protection.
- Organizes all requirements by pressure relief device type, including any exceptions or unique ones identified in a specific BPVC section, enabling users to easily identify all requirements across a device.
- Places capacity certification requirements across BPVC's many sections into one centralized location for easy reference, allowing users to easily compare the test results of different equipment across similar applications.



Errata

- Erratas provide corrections to incorrectly published items, or to correct typographical or grammatical errors in code and standard.
- Errata to codes and standards may be posted on the ASME website under the Committee Pages.
- Such errata shall be used on the date posted.
- On the Committee Page, there is an option available to automatically receive an e-mail notification when errata are posted for a particular code or standard.



Boiler & Pressure Vessel Code

Code Cases

- Created when an urgent need arises for alternative rules concerning materials, construction, or an inservice inspection activity not covered by existing BPVC rules
- Released 7 times over the 2-year BPVC edition cycle
- Provided as part of a subscription service for purchasers of BPV or Nuclear Code Case books
- Available for download until a supplement is issued, after which, the PDF is removed

Interpretations

- Written replies to inquiries concerning interpretation of technical aspects of the Code
- Issued throughout the year, as they are approved
- Posted for free to the interpretations database
- No longer included as a part of the BPVC publication



ASME Interpretations Database							Submit Interpretation
Search Results: 9 Record(s) Found							
Standard	Record #	Interpretation #	Edition	Para Fig Table	Subject	Date of Issuance	Select Interpretation to be Displayed
B31.3	22-19				ASME B31.3 2006, Paragraph 331.1.3, Postweld Heat Treatment (PWHT)	10/13/06	<input type="checkbox"/>
B31.3	21-19				ASME B31.3 2004 Edition, PWHT of Repaired Weld under Table 331.1.1	09/20/06	<input type="checkbox"/>
B31.3	21-12				ASME B31.3 2004 Edition, PWHT Requirement for Carbon Steel Pipe	09/20/06	<input type="checkbox"/>
B31.3	20-44				ASME B31.3 2004 Edition, PWHT Requirements	10/18/05	<input type="checkbox"/>
B31.3	5-06				B31.3 1984 Edition with the B31.3a 1984 Addenda Table 331.3.1 and Paragraph 331.3.6, PWHT Branch Connection Welds	12/02/86	<input type="checkbox"/>
B31.3	2-2				P.No. 1 Materials, PWHT	01/27/83	<input type="checkbox"/>
B31.3	14-690		2012	K 331.1.1(b)	Interpretation on minimum required difference between tempering & PWHT temperature.	09/25/14	<input type="checkbox"/>
B31.3	15-616		B31.3-2014	Para. 331.1.3(a)(2), 331.3(c)	B31.3-2014, Interpretation of Para. 331.1.3(a)(2), 331.3(c) Preheat and PWHT Governing Thickness (Armstrong)	04/28/15	<input type="checkbox"/>
B31.3	16-2140	B31.3-16-19	2014	Paragraph 331.1.1, 331.1.3, and Table 331.1.1	B31.3-2014, Interpretation of Para. 331.1.1, 331.1.3, and Table 331.1.1 PWHT (Marine)	10/13/16	<input type="checkbox"/>

[Reset Selection](#) [Select All](#)
[Display Selected Interpretations](#)



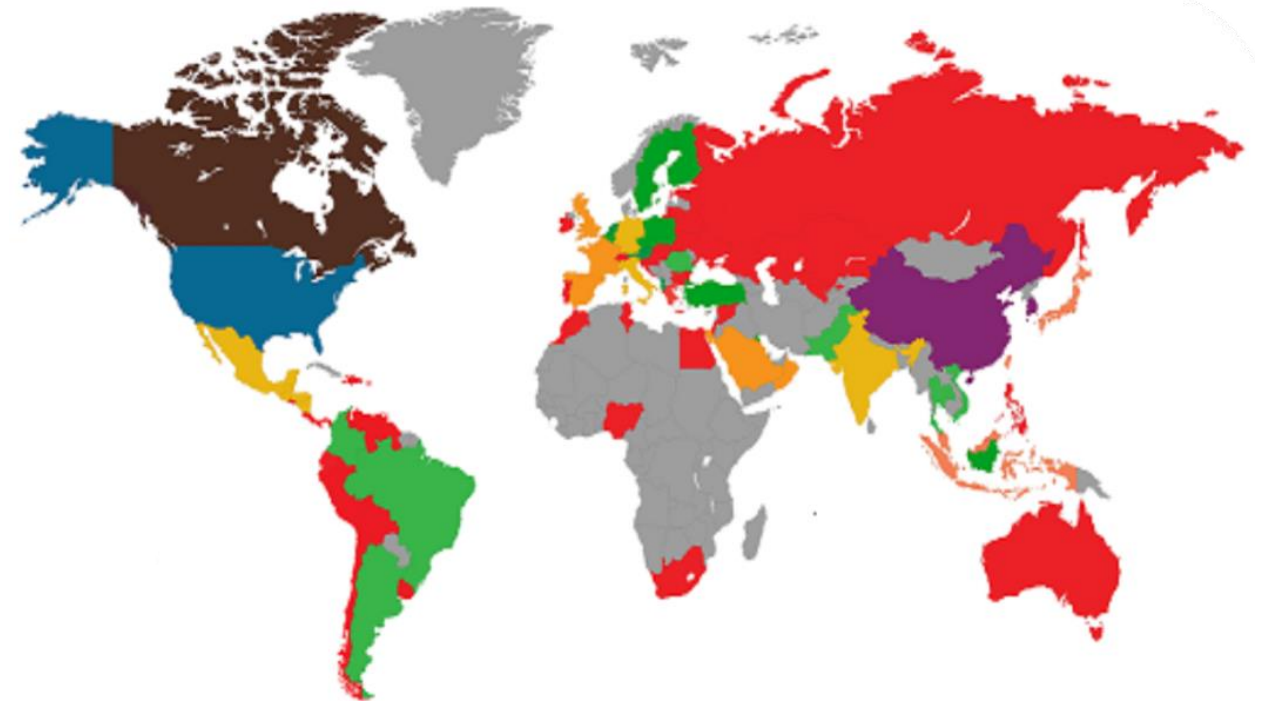
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ASME Certification | Internationally Recognized



- Businesses and regulators around the world rely on the ASME Certification Mark (The Mark).
- ASME Certification helps demonstrate to customers, supply chain, industry, and regulators that your company is committed to public safety and quality.
- The ASME Single Certification Mark (The MARK) is the international mark of safety and quality.
- Companies that use parts and products with The MARK communicate their commitment to the highest levels of public safety and quality.
- That's why businesses and regulators around the world "Demand The Mark."



Number of Certifications by Region



Non-Nuclear BPVC Certification

Section I

- S - Power Boilers
- A - Assembly of Power Boilers
- E - Electric Boilers
- M - Miniature Boiler
- PP - Pressure Piping
- PRT - Parts Fabrication Heating Boilers

Section IV

- H - Heating Boilers/Cast Iron
Sectional Heating Boiler
- HLW - Lined Potable Water Heaters
- PRT - Parts Fabrication Pressure Vessels

Section VIII – Division 1

- U - Pressure Vessels
- UM - Miniature Pressure Vessels
- PRT - Parts Fabrication Pressure Vessels

Section VIII – Division 2

- U2 - Pressure Vessels (Alternative Rules for Pressure Vessels)

Section VIII – Division 3

- U3 - High Pressure Vessels

Non-Nuclear BPVC Certification

Section X

- RP - Fiber-Reinforced Plastic Vessels Transports Tank

Section XII

- T - Transport Tanks
- PRT - Parts Fabrication

Section XIII

- V - Boiler Pressure Relief Valves
- HV - Heating Boiler Safety Valves
- UV - Pressure Vessel Pressure Relief Valves
- UD - Pressure Vessel Pressure Relief Devices
- UV3 - High Pressure Vessel Pressure Relief Valves
- UD3 - High Pressure Vessel Pressure Relief Devices
- TV - Transport Tanks Pressure Relief Valves
- TD - Transport Tanks Pressure Relief Devices

Nuclear BPVC Certification

Sections III and XI

- **N:** Vessels, pumps, valves, piping systems, storage tanks, core support structures, concrete containments, and transport packaging
- **NA:** Field installation and shop assembly of all items
- **NPT:** Parts, appurtenances, welded tubular products, and piping subassemblies
- **NS:** Supports
- **NV:** Pressure relief valves
- **N3:** Transportation containments and storage containments
- **OWN:** Nuclear power plant owner
- **QSC-** Nuclear material organization



ASME Certification | Staying Compliant



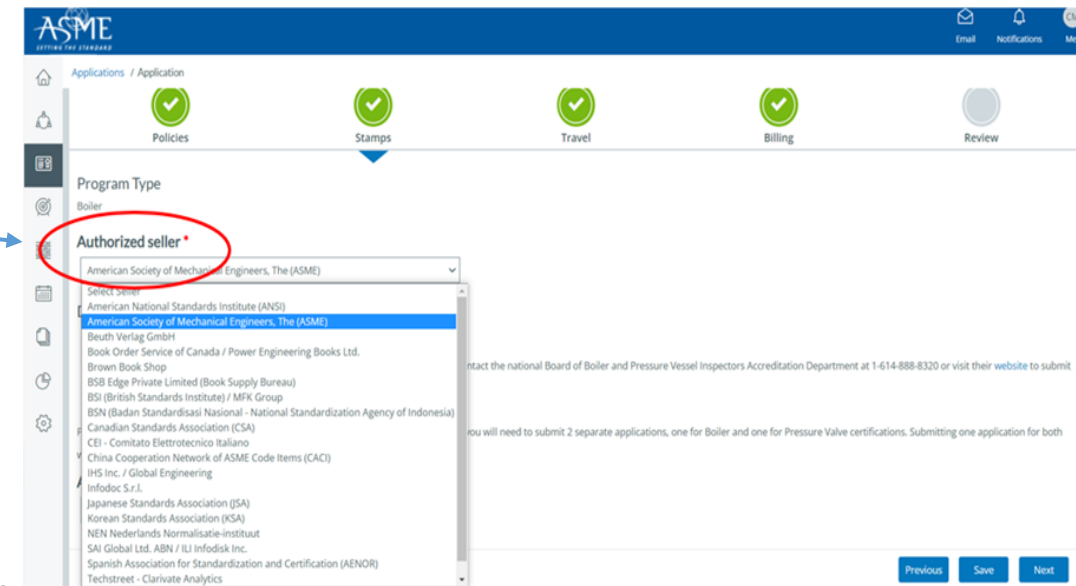
- To be in compliance with ASME Certification, the applicant must be on the latest release of the standard 6 months after its release.

- All Code book purchases will be verified.

- ASME Information Certification BPV-GUI-03 Issue 1, Rev. 1 12-05-2018

Subscription to the indicated sections of the ASME Boiler and Pressure Vessel Code is required for certification to assure that Code users have the latest applicable Code rules.

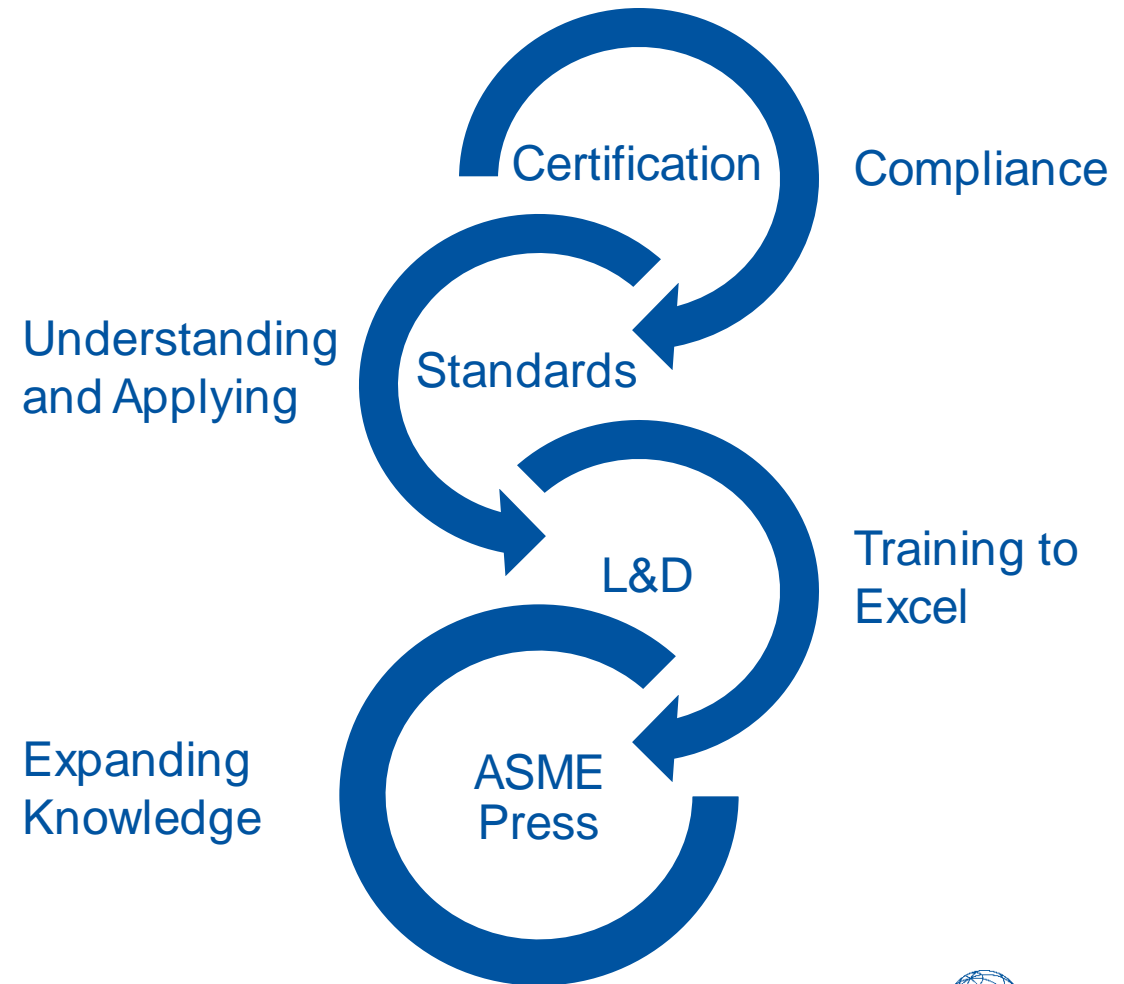
- ASME CA-1–2022, 2022, Chapter 2.2.1.3 *The organization shall obtain and retain a copy of the governing standard(s) from an authorized seller of ASME Codes and Standards. Reproductions and translations from other sources are not acceptable for ASME Accreditation and Certification.*



ASME Certification | U & UM Certifications



- BPVC Section II – Materials Part A-Ferrous Materials Specifications (2 Volumes)
- BPVC Section II – Materials Part B-Nonferrous Material Specifications
- BPVC Section II – Materials Part C-Specifications for Welding Rods Electrodes and Filler Metals
- BPVC Section II – Materials Part D-Properties- (Customary or Metric)
- BPVC Section V – Nondestructive Examination
- BPVC Section VIII – Rules for Construction of Pressure Vessels Division 1
- BPVC Section IX – Welding, Brazing, and Fusing Qualifications
- CA-1 Conformity Assessment Requirements



Resources BPVC/Certification

BPVC Resources

STANDARDS AND CERTIFICATION

Publications Information

BPVC Resources

Code Cases of the ASME Boiler and Pressure Vessel Code

ASME Data Report Forms

Standards & Certification Update

Energy Standards, Certification & Training Programs

Safety Codes and Standards

Performance Test Codes

Standards & Certification FAQ

ISO Committees and U.S. Technical Advisory Groups

History of ASME Standards

Engineering Student Resources

ASME Standards & Certification Member Training Resources and Guidance Documents

ASME BPVC Stress Tables >

This database is the online version of the tables found in the ASME Boiler & Pressure Vessel Code, Section II, Part D — Properties, and is available in U.S. customary units and metric units.

Approval of New Materials >

This is a guideline on how you may obtain approval of new material used for the construction of boilers, pressure vessels, & nuclear components in accordance with the ASME Boiler & Pressure Vessel Code.

ASME Certificate Holder Search >

Find an ASME Certificate Holder, such as AIA-Authorized Inspection Agency, S-Power Boilers and more.

ASME BPVC Interpretations On-Line >

Interpretations to the Code that were previously distributed by hard copy in January are now available on-line.

ASME Data Report Forms >

Complete list of Data Report Forms from the Boiler & Pressure Vessel Code Sections.

BPVC Code Cases >

Code Cases are issued by the Committee when there is an urgent need to provide alternatives to existing Code requirements or acceptable Code materials.

ASME BPVC Codes & Standards Errata and Notices >

Access posting of Errata or Notices to a BPV Code

ASME Boiler and Pressure Vessel Code Week >

Information regarding Boiler Code Week meetings including dates and locations.



The American Society of Mechanical Engineers



[Certification Accreditation](#) > [Resources and Events](#) > [Downloadable Resources](#)

Frequently Asked Questions

Downloadable Resources

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Downloadable Resources

General Downloads

[Boiler and Pressure Vessel Certification \(BPV\)](#)

[Bioprocessing Equipment Certification \(BPE\)](#)

[Nuclear Quality Assurance Certification \(NQA\)](#)

[Nuclear Component Certification \(N-Type\)](#)

[Nuclear Material Organization Certification \(QSC\)](#)

[Reinforced Thermoset Plastic Corrosion-Resistant Equipment Certification \(RTP\)](#)

[Authorized Inspection Agency \(AIA\)](#)

[Pressure Relief Device Testing Lab \(PRD\)](#)

Trouble accessing PDF files? Simply download the PDF to your local computer and open with [Adobe Acrobat Reader](#).

General Downloads Notices

Conduct

Procedures Conduct of ASME Surveys, Reviews, Audits, Investigations, and Interviews
[Download >>](#)

Notice on Requests for Certificate Extensions

Provides information for Certificate Holders who want to request an extension of the expiration date of their certification.
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[Policy on the Use of the Certification Mark in Advertising](#)

Due Process

A notice about the rights an organization has during the survey/review process.
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Notice on Use of Electronic Version of the Boiler Pressure Vessel Code by Certificate Holders

Provides information for companies who wish to use an electronic version of the ASME BPVC Books.
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[How to Change Primary Contact Information](#)

Now Presenting



Steven J. Rossi

ASME

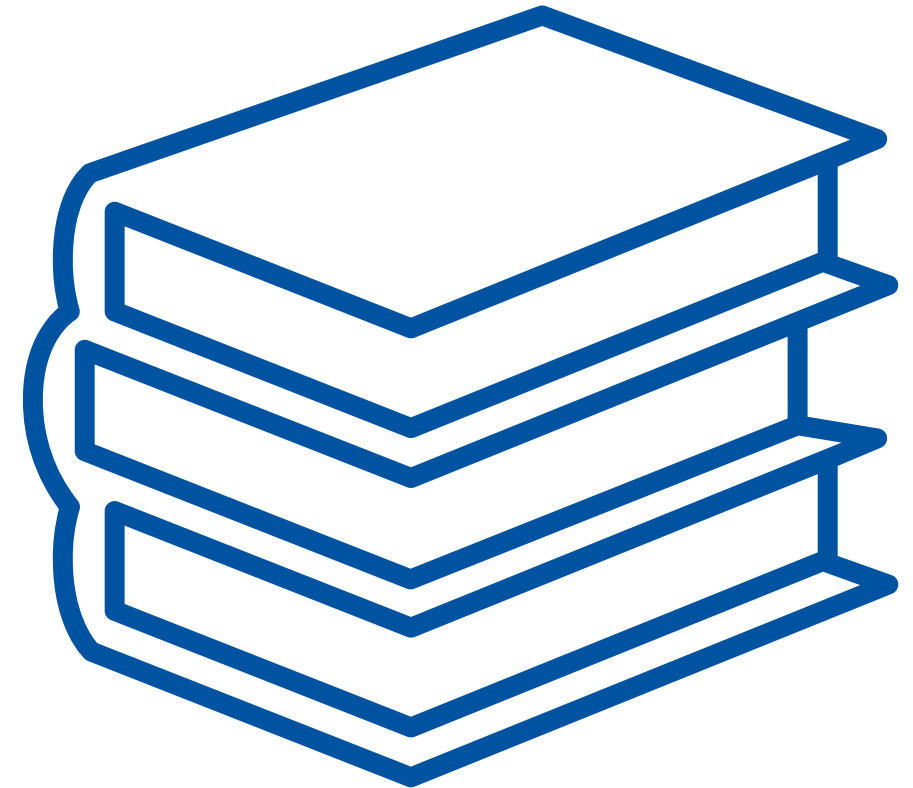
Project Engineering Manager

Standards and Engineering Services

rossisj@asme.org

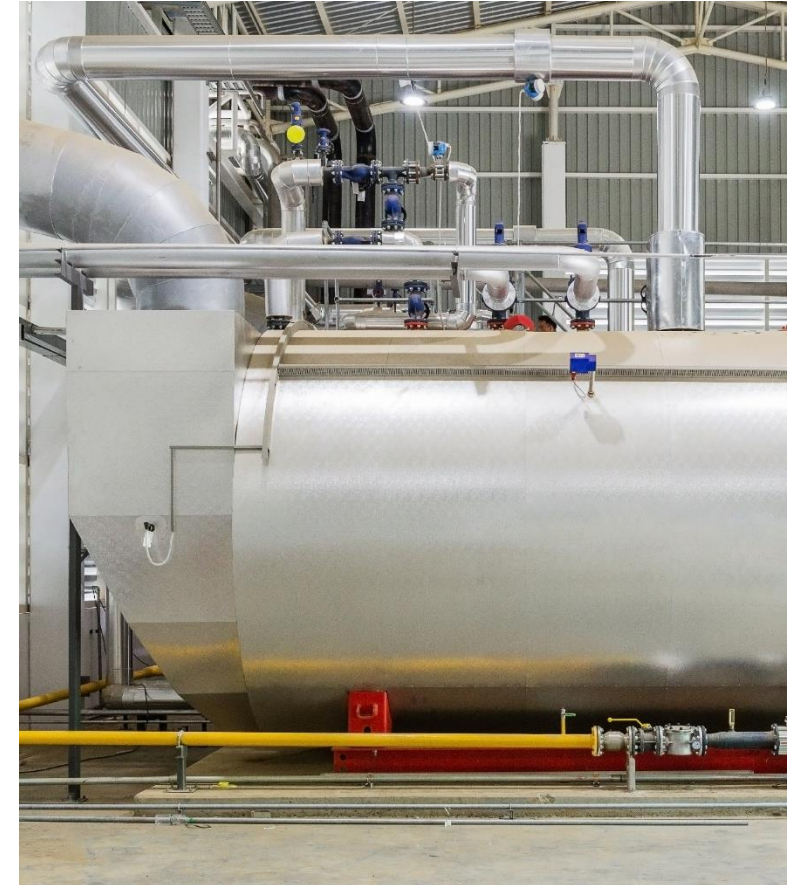
2023 BPV Code Major Changes

- This presentation is a general summary of some of the major changes that will appear in the 2023 Edition of the ASME Boiler & Pressure Vessel Code.
- All changes to the Code will be available when the 2023 Edition is issued in July, 2023.
- The specific detailed changes should be carefully reviewed and verified as published in the 2023 Edition to ensure compliance with Code requirements.



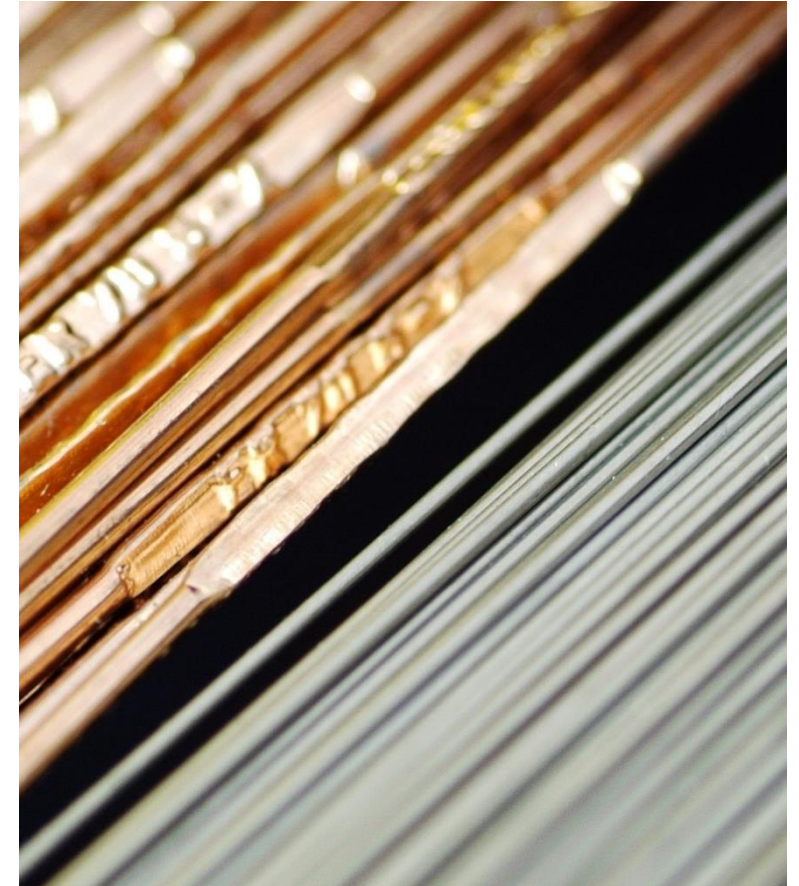
Section I – Rules for Construction of Power Boilers

- Tables PG-67.5 & PG-67.5M expanded and revised for the Super-critical (Ksc) capacity correction factors in determining the rated relieving capacity of Pressure Relief Devices.
- PW-28.1.3 revised to permit simultaneous qualification of weld procedures by more than one organization.
- Revised y factor table in PG-27.4.6 to make consistent with Section II-D T-Notes.
- PW-39.2 revised to address the use of buttering welds without PWHT of both materials.
- Form P-4 revised to include a section for documenting BEP under qualifying conditions.
- Tables PG-67.5, PG-67.5M, PG-68.7, and PG-68.7M relocated to an appendix to improve readability of overpressure protection requirements.



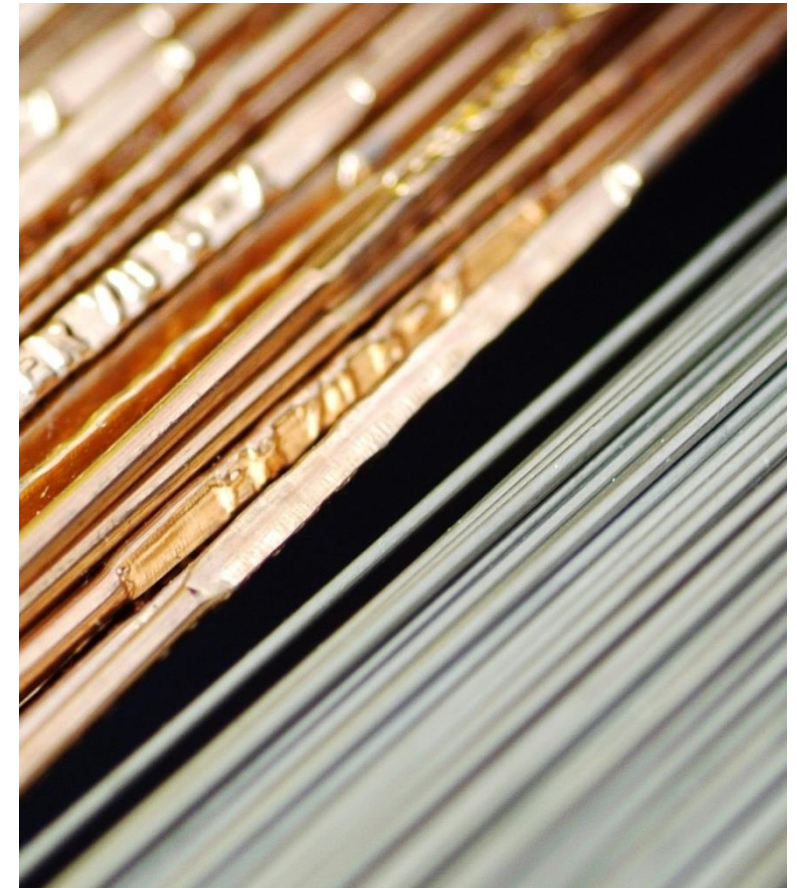
Section II – Materials, Part A, Ferrous Material Specifications

- Updates to the latest adopted edition have been made to over 60 specifications.
- Two new specifications have been added:
 - SA-439/439M Specification for Austenitic Ductile Iron Castings
 - SA-1058/1058M Standard Test Methods for Mechanical Testing of Steel Products – Metric
- Two specifications have been removed:
 - SA-557/SA-557M Specification for Electric-Resistance-Welded Carbon Steel Feedwater Heater Tubes
 - SA-731/SA731M Specification for Seamless, Welded Ferritic, and Martensitic Stainless Steel Pipe
- A new statement of policy on the use of ASME material specifications has been added.
- Mandatory Appendix II has been retitled to “The Framework of ASME Material Specifications” and has been completely rewritten.



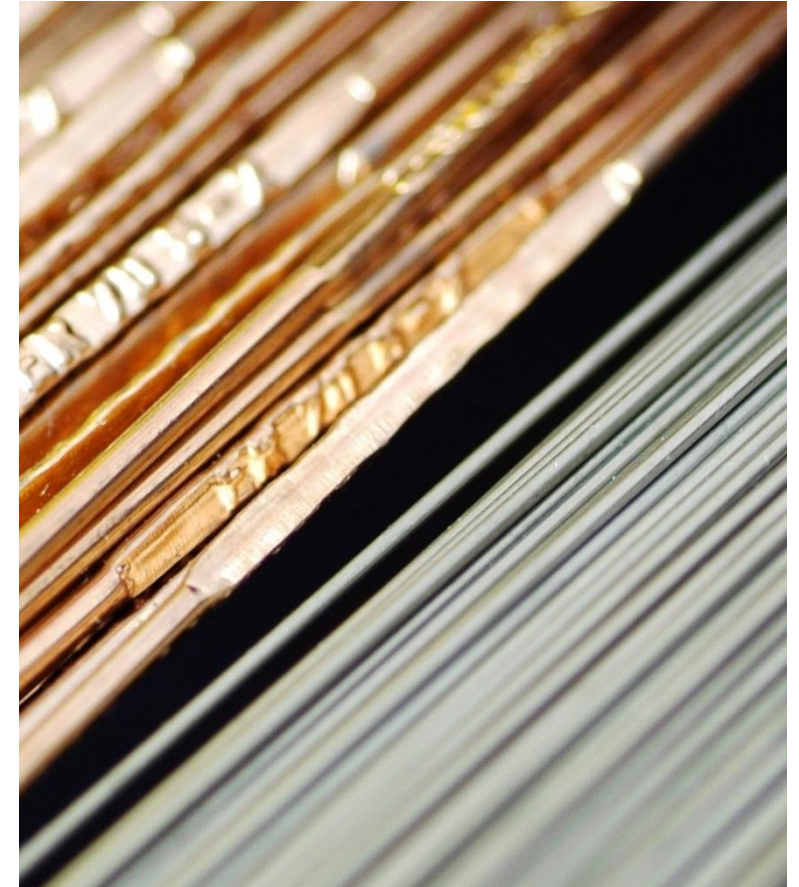
Section II – Materials, Part B, Nonferrous Material Specifications

- Updates to the latest adopted edition have been made to over 25 specifications.
- The range of acceptable ASTM editions has been updated for a number of specifications.
- A new statement of policy on the use of ASME material specifications has been added.
- Mandatory Appendix II has been retitled to “The Framework of ASME Material Specifications” and has been completely rewritten.



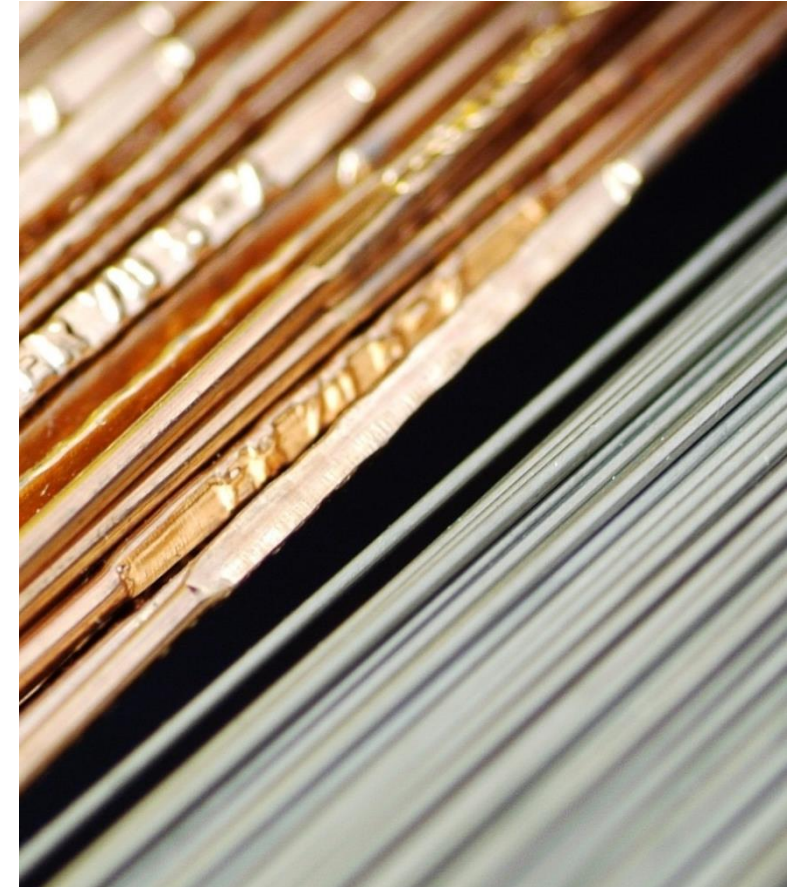
Section II – Materials, Part C, Specifications for Welding Rods, Electrodes, and Filler Metals

- 14 AWS specifications for arc welding electrodes, gas welding rods and other filler metals were adopted or updated into the 2023 edition:
 - SFA-5.5/SFA-5.5M, SFA-5.9/SFA-5.9M, SFA-5.10/SFA-5.10M, SFA-5.13/SFA-5.13M, SFA-5.16/SFA-5.16M, SFA-5.18/SFA-5.18M, SFA-5.20/SFA-5.20M, SFA-5.23/SFA-5.23M, SFA-5.24/SFA-5.24M, SFA-5.28/SFA-5.28M, SFA-5.29/SFA-5.29M, SFA-5.30/SFA-5.30M, SFA-5.31/SFA-5.31M, SFA-5.32/SFA-5.32M



Section II – Materials, Part D, Properties (Customary, Metric)

- Code cases 2577, 2586-1, 2591, 2633, 2687-1, 2849, 2903, 2923 have been incorporated.
- Additions and revisions to stress tables and mechanical property tables have been made to support updated specifications.
- SA-283 Grade A and Grade B lines have been removed.
- Type/Grade column has been added to Tables 2B and 5B, and many values have been populated.



Section III – Rules for Construction of Nuclear Facility Components, Subsection NCA, General Requirements for Division 1 and Division 2

- NCA-3000 and 5000 have been updated to permit the use of newly published Section XI, Division 2, Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Reactor Facilities, as a basis for designing for inservice monitoring and nondestructive examination (NDE).
- Table NCA-7100-2 has been updated to align with revisions made to Table NCA-7100-1. Updates to the table include the identification of other acceptable editions and applicable subsections for listed referenced standards.



Section III – Rules for Construction of Nuclear Facility Components, Appendices

- Mandatory Appendices XI, XII, and L have been revised to extend the applicability to Section III, Division 5, Subsection HC, Subpart B.
- Mandatory Appendix XIII-1223 has been revised and updated to address the International Engineering Alliance and the European Federation of National Engineering Associations concerning the Certifying Engineer.
- Mandatory Appendix XXVIII was developed to allow for the usage of Powdered Metal/Hot Isostatic Pressing (PM/HIP) advance manufacturing for the production of items made from 316L SS as one Process Method.
- Nonmandatory Appendix G-2223 has been revised to clarify toughness requirements for nozzles and to provide methods that may be used for external loads, thermal loads, and internal pressure, as currently addressed.
- Mandatory Appendix XXVI has been revised and updated to include sidewall fusion, fittings, volumetric examination, and Code Case N-891.



Section III – Rules for Construction of Nuclear Facility Components, Subsection NB, Class 1 Components

- NB-2121(a) has been revised to permit the use of advanced manufacturing. This revision is to permit use of advanced manufacturing product forms not included in Section II, Part D, Subpart 1, Tables 2A, 2B, or Article NB-2000, provided that the product form meets the requirements of Mandatory Appendix XXVIII.
- NB-2321.2 has been revised to remove the requirement to use full-size test specimens, and test-specimen requirements were adjusted to be in accordance with SA-370.
- NB-5000 has been updated to permit the use of newly published Section XI, Division 2, Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Reactor Facilities, as a basis for designing for inservice monitoring and nondestructive examination (NDE).
- NB-5540 has been developed to permit the use of CP-189 as an acceptable NDE personnel qualification standard. Section III previously required qualification of examiners only to SNT-TC-1A, while Section XI requires personnel qualification per CP-189.



Section III – Rules for Construction of Nuclear Facility Components, Subsection NCD, Class 2 and Class 3 Components

- NCD-2121(a) has been revised to permit the use of advanced manufacturing. This revision is to permit the use of advanced manufacturing product forms not included in Section II, Part D, Subpart 1, Tables 2A, 2B, or Article NCD-2000, provided the product form meets the requirements of Mandatory Appendix XXVIII.
- NCD-2321.2 has been revised to remove the requirement to use full-size test specimens, and test-specimen requirements were adjusted to be in accordance with SA-370.
- NCD-3124 has been updated to permit the use of Section XI, Division 2, Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Reactor Facilities, as a basis for designing for inservice monitoring and nondestructive examination (NDE).
- NCD-5540 has been developed to permit the use of CP-189 as an acceptable NDE personnel qualification standard. Section III, previously required qualification of examiners only to SNT-TC-1A, while Section XI, requires personnel qualification per CP-189.



Section III – Rules for Construction of Nuclear Facility Components, Subsection NE, Class MC Components

- NE-2321.2 has been revised to remove the requirement to use full-size test specimens, and test-specimen requirements were adjusted to be in accordance with SA-370.
- NE-3125 has been updated to permit the use of Section XI, Division 2, Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Reactor Facilities, as a basis for designing for inservice monitoring and nondestructive examination (NDE).
- NE-5540 has been developed to permit the use of CP-189 as an acceptable NDE personnel qualification standard. Section III, previously required qualification of examiners only to SNT-TC-1A, while Section XI, requires personnel qualification per CP-189.



Section III – Rules for Construction of Nuclear Facility Components, Subsection NF, Supports

- NF-1000, NF -2000, NF -3000, Table NF-D, and Appendix NF-E have been revised for the addition of requirements for energy absorbers. Energy absorbing devices have not been fully defined prior to the noted revision.
- NF-2321.2 has been revised to remove requirement to use full-size test specimens, and test-specimen requirements were adjusted to be in accordance with SA-370.
- NF-3300 has been revised to reflect applicable requirements, for austenitic stainless-steel design, found in *AISC Design Guide 27*.
- NF-5540 has been developed to permit the use of CP-189 as an acceptable nondestructive examination (NDE) personnel qualification standard. Section III, previously required qualification of examiners only to SNT-TC-1A, while Section XI, requires personnel qualification per CP-189.



Section III – Rules for Construction of Nuclear Facility Components, Subsection NG, Core Support Structures

- G-2321.2 has been revised to remove the requirement to use full-size test specimens, and test-specimen requirements were adjusted to be in accordance with SA-370.
- NG-3200 and 3220 have been revised to facilitate merging primary stress limits, special stress limits, Level C and Level D limits, limit analysis, and experimental analysis into Section III, Appendix XIII-3000.
- NG-5540 has been developed to permit the use of CP-189 as an acceptable nondestructive examination (NDE) personnel qualification standard. Section III, previously required qualification of examiners only to SNT-TC-1A, while Section XI, requires personnel qualification per CP-189.



Section III – Rules for Construction of Nuclear Facility Components, Division 2, Code for Concrete Containments

- CC-2331.2, CC-3532.1.7, Table CC-4333-1, and Table D2-VIII-1410-1's requirements, related to ASTM A615-20, have been updated to align with the current material requirements and grade options listed in the most current ASTM standard.
- CC-2466.2, now includes a "Note" to clarify what constitutes a change in heat treatment conditions when pre-stressing element materials.
- CC-2522.1.2 has been revised to remove requirement to use full-size test specimens, and test-specimen requirements were adjusted to be in accordance with SA-370.



Section III – Rules for Construction of Nuclear Facility Components, Division 3, Containment Systems for Transportation and Storage of Spent Nuclear Fuel and High-Level Radioactive Material

- WB-2321.2, WC-2321.2, and WD-2321.2 have been revised to remove requirement to use full-size test specimens, and test-specimen requirements were adjusted to be in accordance with SA-370.



Section III – Rules for Construction of Nuclear Facility Components, Division 4, Fusion Energy Devices

- This is the first edition of BPVC Section III Division 4. It is expected that the global fusion community will continue to develop these requirements based on lessons learned from the evolution of fusion-power technologies and experiences.



Section III – Rules for Construction of Nuclear Facility Components, Division 5, High Temperature Reactors

- Table HBB-3225-4 was revised to extend thermal aging factor for Class A, Grade 91 components from 300,000 to 500,000 hours.
- Mandatory Appendix HBB-I-14 Tables were revised to extend stress rupture factor values for Grade 91 from 300,000 to 500,000 hours.
- HBB-T-1800 was revised to extend isochronous stress-strain curves for Grade 91 components from 300,000 to 500,000.
- HHA-3142 and HHB-3142 have been revised to remove EDN (damage dose unit) and only use dpa (displacements per atom) damage dose unit.
- Nonmandatory Appendix HBB-Z added to provide guidance on constructing a suitable inelastic model from data and to offer designers an acceptable reference model for Grade 91.
- Nonmandatory Appendices HHB-D and HHB-E have been developed to cover Carbon-Carbon (C-C) Ceramic Matrix Composites.



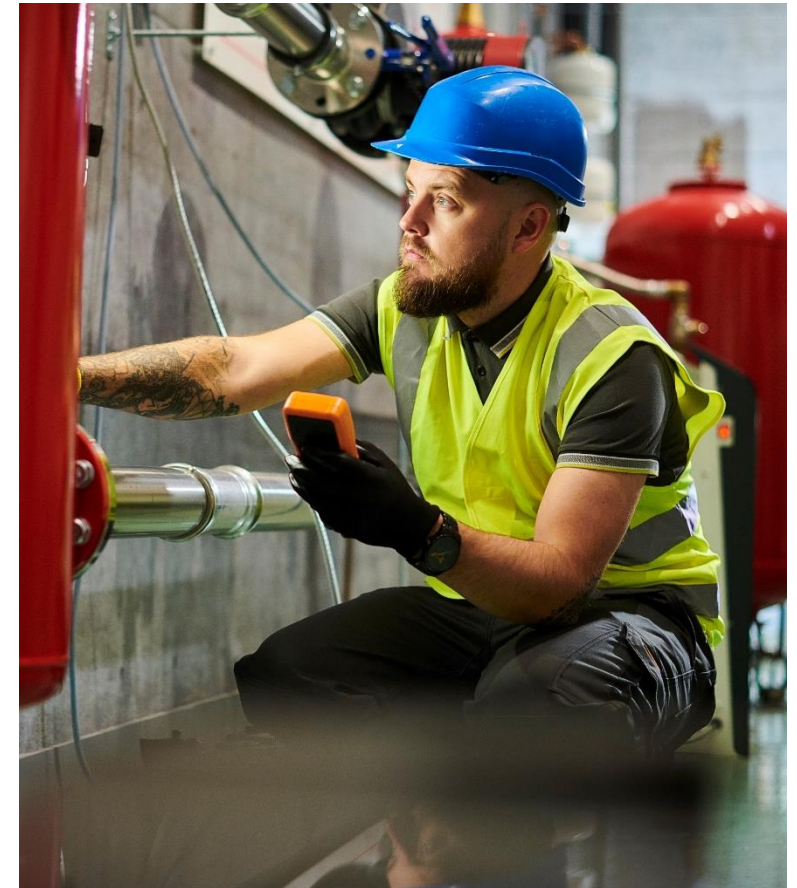
Section IV – Rules for Construction of Heating Boilers

- HG-715, HG-803, HLW-810, HLW-902, HLW-903, HLW-904, & HLW-906 were revised to support the proposed drain valve language in HG-803.2(c)(3) and HG-803.3(c)(2), in order to align with the requirements in Code Cases 2873 and 2983, so they can be incorporated into the Section IV code.
- Section IV, Table 2-100, now references the "latest edition" of the CA-1 Standard for Conformity Assessment Requirements, since Section 5.4, in the 2020 Edition of CA-1, incorporated requirements for reapplication of the ASME Single Certification Mark.
- A provision was added to HLW-602 and HG-531 for the removal of a nameplate or marking of a "Part" when incorporating the Part into a boiler that is to be certified



Section V – Nondestructive Examination

- Article 1, T-120(e) has been modified to include exceptions made to SNT-TC-1A and CP-189. This eliminated the need for Mandatory Appendices III & IV, which were removed.
- Added a new Mandatory Appendix for Article 12 on the evaluation of the sensitivity of an acoustic emission instrumentation.
- Added requirements for the use of TOFD without the supplemental scan of near-surface.
- Revised Article 9, para. T-953, Remote Visual, to accommodate deployment mechanisms like unmanned aircraft vehicles and systems.
- Adopted updated ASTM Specifications documents: ASTM E273-2020, E999-2020, E1030-2021, E1114-2020, E1165-2020, E2491-2013(R2018), E213-2022, A745-2020, E2491-2018, E2700-2020, D7091-2021, E243-2018, E797-2021, E976-2021, E1067-2018, E1118-2020, E1419-00, E2075-2020, and E2261-2021.



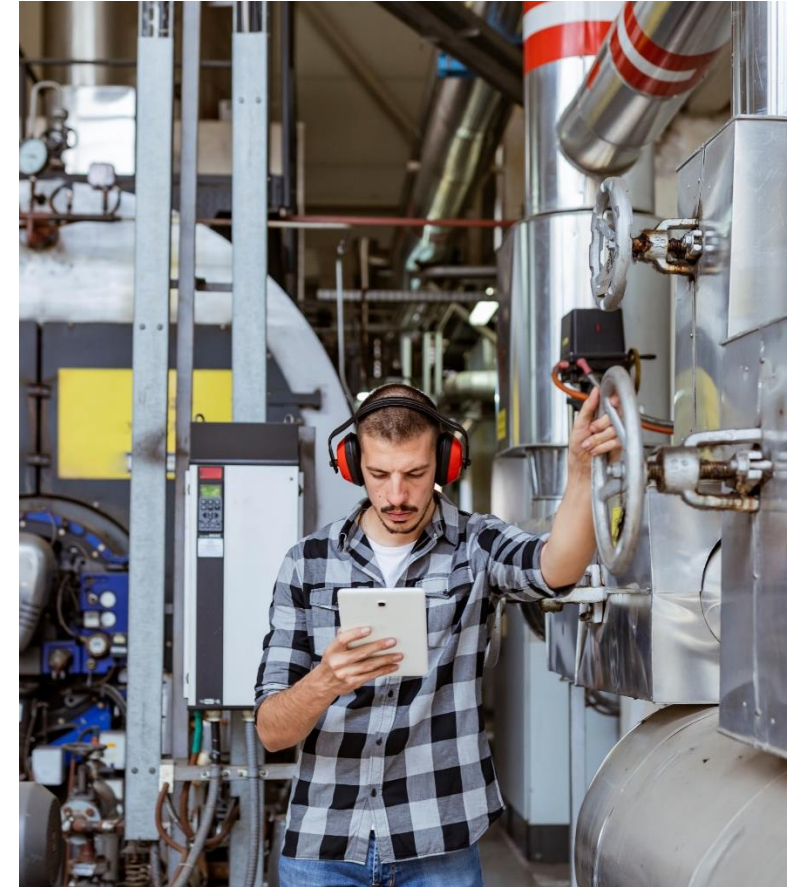
Section VI – Recommended Rules for the Care and Operation of Heating Boilers

- Added definition of relief valve to Article 2 so it was consistent with BPVC XIII.
- Added clauses to para. 6.4 "Pressure Relief Valve Discharge Piping" to align with similar changes made to BPVC IV, para. HG-716.6, along with the creation of BPVC XIII, Section 12.8.



Section VII – Recommended Guidelines for the Care of Power Boilers

- New section 103.1.4 added to include operational information for changeover valves.



Section VIII – Rules for Construction of Pressure Vessels, Division 1

- Added a new paragraph UG-84(d)(3) to clarify the impact test requirements for diffusion welding (DFW).
- Paragraph UG-101(a)(5) was added to address sharing of proof testing reports between manufacturers owned by the same entity.
- Part UHX has been realigned and revised for consistency between the heat exchanger types. The shell and channel coefficients have been revised to be based on the mean diameter instead of the inside diameter, which is consistent with PTB-7.
- Part UHX and Appendix 26 design rules, which are identical to Part 4.18 and 4.19 of Division 2, have been removed and point to Part 4.18 and 4.19 when appropriate. This will enable identical requirements for all heat exchangers, resulting in easier maintenance through one set of rules.
- Revised the “PRT” designator to “PRT VIII-1” throughout Section VIII, Division 1.



Section VIII – Rules for Construction of Pressure Vessels, Division 2, Alternative Rules

- Part 2 has been revised to remove Certifying Engineers for Class 2 Design-by-Rule (DBR) applications. This action will eliminate conflicts with international engineering registration requirements for the majority of applications.
- Part 4.18 has been realigned and revised for consistency between the heat exchanger types. The shell and channel coefficients have been revised and are now based on the mean diameter instead of the inside diameter, which is consistent with PTB-7.
- Paragraph 4.2.5.7, Category F, Locations, has been added in order to assign a common joint category to tube-to-tubesheet welds.
- Paragraph 5.4, Protection against failure from buckling, has been completely re-written and a new table of load cases, Table 5.8, has been added.
- Paragraph 5.5.2.4 and Table 5.10 have been revised and now provide a quick-and-simple method to screen components in cyclic service, eliminating the need for a full-fatigue analysis.
- Revised the “PRT” designator to “PRT VIII-1” throughout Section VIII, Division 2.



Section VIII – Rules for Construction of Pressure Vessels, Division 3, Alternative Rules for Construction of High Pressure Vessels

- In KD-430, the minimum Delta Kth for the calculation of crack growth rates now includes Carbon and low-alloy steels with S_y less than or equal to 90ksi (620MPa).
- KD-322 provides additional clarity on the logarithmic interpolation between tabular values for individual design curves in Figures KD-320.1, KD-320.1M, KD-320.2, and KD-320.2M. This new edition allows for linear interpolation for an intermediate ultimate tensile strength.
- KM-270 now includes the notch tensile-strength test along with the calculation of the notch strength ratio.
- KM-234.1 (b) has been revised to lower the minimum-design-metal temperature for all materials that are not fully austenitic stainless steels.
- KG-310, KG-311, and KG-323, along with KD-740 were revised to support manufactures seeking to use a single user's design specification for the production of vessel designs intended for use across multiple jurisdictions.



Section IX – Welding, Brazing, and Fusing Qualifications

- QG-108 has been revised to remove the 1962 provision and clarify the status of old PQRs when writing a WPS to a later edition.
- Definition of "initial heating interfacial pressure" was added to QG-109.2 and previous omissions of "sidewall-fusing" was added to pertinent definitions within QG-109.2.
- Table QW-264 has a new requirement that includes carbon equivalent limits for applicable steel alloys, when laser welding is performed, in order to address the increased risk of any cracks occurring.
- A new paragraph in QW-403 also includes the new variable for a change in base metals.
- Table QW/QB-422 has been revised to include
 - Weld metals based on SFA classification: SFA-5.9, SFA-5.18, & SFA-5.28
 - An explanatory note-QW-424.3
 - Base metal specification and grades for IRAM-IAS U 500-42, an Argentinian standard for structural use of hot rolled carbon steel sheets
- Nonmandatory Appendix L has been revised to further clarify the qualification requirements for welders and welding operators.



Section X – Fiber-Reinforced Plastic Pressure Vessels

- Clarified service life requirements for Class III vessels, in 8-100.6, to indicate that the service life for glass fiber reinforced vessels is limited to 20 years, but the maximum service life is not limited for carbon fiber reinforced vessels.
- In 8-700.5.8, other leak test methods for Class III vessels that may be more reasonable and cost effective, but still yields satisfactory results, based on experience to date, are now permitted.



Section XI – Rules for Inservice Inspection of Nuclear Reactor Facility Components, Division 1, Rules for Inspection and Testing of Components of Light-Water-Cooled Plants

- IWB-2200(b) and IWC-2200(b) have been revised to indicate that Construction Code examinations may be credited for Section XI, Preservice Examination Credit, and that these examinations may be performed by personnel that are qualified in accordance with Section XI or the Construction Code, which may be different than Section III.
- IWL-2330 has been revised to address the use of the term Registered Professional Engineer (RPE). In addition, the Responsible Engineer requirements are now applicable to plants located outside of the United States and Canada.
- Mandatory Appendix Supplement 1 has been revised to allow use of calibration blocks fabricated from similar chemical analysis, tensile strength, and metallurgical structure.
- Mandatory Appendix VIII, Supplements 2, 4, 5, 8, 10, 11, 14, and 15 have been revised. The requirement for “specimen identification” and “identification” to be obscured or concealed to maintain a blind test has been removed.



Section XI – Rules for Inservice Inspection of Nuclear Reactor Facility Components, Division 2, Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Reactor Facilities

- The title and contents of Section XI, Division 2 have been revised to replace the term "Power Plant" with "Facility" to signify the use of the Code for nuclear facilities in addition to power plants.
- IV-1.3.2.2(d) has been revised to clarify how many nondestructive examination (NDE) Level IIIs are required for monitoring and non-destructive examination (MANDE), and what the NDE Level III requirements are in order to be certified for NDE methods and techniques.
- RIM-1.2 has been revised and now requires that the same edition of Section XI, Division 1 must be used when referenced in Section XI, Division 2.
- RIM-2.7.3 has been revised to include any MANDE methods approved by the monitoring and non-destructive examination panel (MANDEEP) for creating a pre-service baseline.
- RIM-4.2.4 has been revised to clarify when NDE volumetric and surface examinations may be used, when leakage testing is not applicable after a repair/replacement activity.



Section XII – Rules for Construction and Continued Service of Transport Tanks

- TG-110.2(a) has been revised from 3,000 to 2,000 psig to align with the upper limit in Modal Appendix 4.
- Paragraph TD-320 has been added to address quick actuating devices. It will reference Section VIII, Division 1, UG-35.2 and Nonmandatory Appendix FF.
- TOP-170(a) has been revised to outline that the pressure relief device shall communicate with the vapor space of the vessel, and the requirement for 450 L (120 gal) has been removed since it is no longer applicable.
- Model Appendix 1, Article 2, Paragraph 1-2.1(c) has been revised to correct the minimum set pressure to 110% of MAWP or 3.3 psi, whichever is greater.
- TS-110(a), TS-200, Form T-2A, Forms T-2B, Form T-2C, and Nonmandatory Appendix D, item 1, item 3, and Note 1 have been revised to change PRT to XII PRT to match the designator shown in CA-1-2020, Table 1.1-1.
- Nonmandatory Appendix E-6(o) has been revised to change the required minimum melting point of brazing material from 525C (977F) to 538C (1000F). Nonmandatory Appendix E-6(p) was added. This new section requires pipe joints to be threaded, welded, or flanged.



Section XIII – Rules for Overpressure Protection

- In Para 3.3.2, Seat and Disks, the meaning of the term steam cutting has been elaborated on.
- In Para 3.4.2.3, Test Results, guidance was provided on what to do when valves cannot be adjusted to meet blowdown performance, per Table 3.4.2.3-1.
- In Part 3, Section 3.5, Part 4, Section 4.2 and Section 1-2, definitions for assembler and manufacturer were revised for clarity and any requirements have been moved to the body of the standard.
- In Section 3.6 and Table 3.6, set pressure tolerance of -0% $+10\%$ has been added to Table 3.6.1.1-2 for UV valves when the sole source of overpressure is exposure to fire or heat.
- In 3.6.4, Seat Tightness Test, water and gas test media have been generalized to incompressible and compressible fluids.



A word cloud featuring the word "THANK YOU" in large blue letters, surrounded by various translations of "thank you" in many languages and scripts, including English, Spanish, French, German, Italian, Chinese, Japanese, Korean, Hindi, and others. The words are arranged in a circular pattern, with "THANK YOU" being the largest and most prominent.