MPR
CELEBRATING 60 YEARS

Nuclear Mechanical Structures and Components

An Introduction to the ASME Boiler and Pressure Vessel Code

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ASME Boiler and Pressure Vessel Code

ASME's BPVC is an international set of standards

- Recognized by 116 countries
- Supports manufacturers whose products are used across these many regions
- Allows companies, who build to the Code and use the ASME stamp, to demonstrate their commitment to both safety & quality
- First published in 1914 to cover power boilers
- Developed under ANSI Consensus Standards Processes and Procedures

ASME Boiler and Pressure Vessel Code

The 2023 Edition consists of

- 13 Sections
- 32 Volumes
- 19,000+ pages

Boiler and Pressure Vessel Codes are published on a two-year cycle

- Next Edition will be published July 2025

The Boiler and Pressure Vessel Code is divided into three broad groups:

- Construction Codes
- Inservice Codes
- Service Codes

ASME Code Application

ASME BPVC Section I:
Rules for Construction of Power Boilers

ASME BPVC Section II:
Materials

ASME BPVC Section III:
Rules for Construction of Nuclear Facility Components

ASME BPVC Section IV:
Rules for Construction of Heating Boilers

ASME BPVC Section V:
Nondestructive Examination

ASME BPVC Section VI:
Recommended Rules for the Care and Operation of Heating Boilers

ASME BPVC Section VII:
Recommended Guidelines for the Care of Power Boilers

ASME BPVC Section VIII:
Rules for Construction of Pressure Vessels

ASME BPVC Section IX:
Welding and Brazing Qualifications

ASME BPVC Section X:
Fiber-Reinforced Plastic Pressure Vessels

ASME BPVC Section XI:
Rules for Inservice Inspection of Nuclear Power Plant Components

ASME BPVC Section XII:
Rules for the Construction & Continued Service of Transport Tanks

ASME BPVC Section XIII:
Rules for Overpressure Protection

Construction Codes

ASME BPVC Section I:
Rules for Construction of Power Boilers

ASME BPVC Section II:
Materials

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ASME BPVC Section XIII:
Rules for Overpressure Protection

Care/Operations/Inservice Codes

ASME BPVC Section I:
Rules for Construction of Power Boilers

ASME BPVC Section II:
Materials

ASME BPVC Section III:
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Focus for Presentation

ASME BPVC Section I:
Rules for Construction of Power Boilers

ASME BPVC Section II:
Materials

ASME BPVC Section III:
Rules for Construction of Nuclear Facility Components

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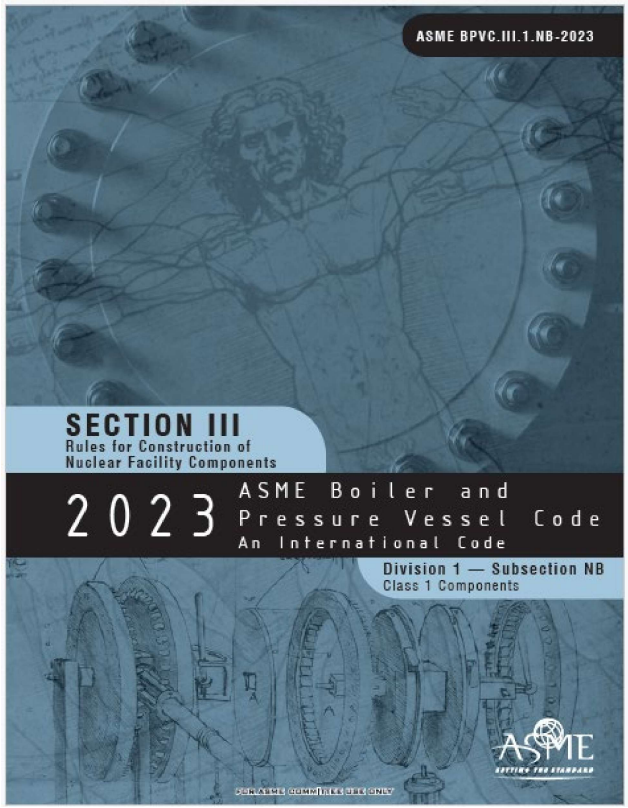
ASME Section III

Rules for Construction of Nuclear Facility Components



ASME Stakeholders and Committee Representation

Owners

- Establish Requirements

Certificate Holders

- Construct Components

Inspectors

- Third-Party Oversight

Regulators

- Legal Authority

Organization of Section III (continued)

Subsection NCA – General Requirements for Divisions 1 and 2

Division 1 – Metallic Components

Division 2 – Concrete Containments and Vessels

Division 3 – Containment Systems for Storage/ Transport of Spent Nuclear Fuel and High-Level Radioactive Material

Division 4 – Fusion Energy Devices

Division 5 – High Temperature Reactors

Appendices

Organization of Section III

General Requirements for Division 1 and 2

- Subsection NCA

Division 1 – Metallic Components

- Subsection NB (Class 1 Components)
- Subsection NCD (Class 2 and Class 3 Components)
  - Prior to 2021 Edition - NC for Class 2 and ND for Class 3
- Subsection NE (Class MC Metal Containments)
- Subsection NF (Supports)
- Subsection NG (Class CS Core Support Structures)
- Subsection NH (Class 1 Elevated Temperature Service
  - Last published in 2015, replaced by Division 5

Division 2 – Code for Concrete Containments

- Subsection CC (Concrete Containments)

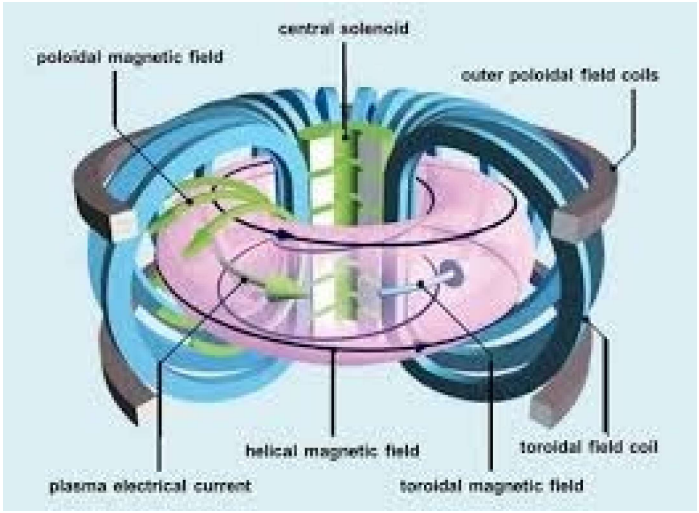
Organization of Section III (continued)

Division 3 – Containment Systems for Transportation & Storage of Spent Nuclear Fuel and High-Level Radioactive Material

- Subsection WA – General Requirements for Division 3
- Subsection WB – Class TC Transportation Containments
- Subsection WC – Class SC Storage Containments
- Subsection WD – Class ISS Internal Support Structures

Division 4 – Fusion Energy Devices

- Published for the first time in the 2023 Edition



Organization of Section III (continued)

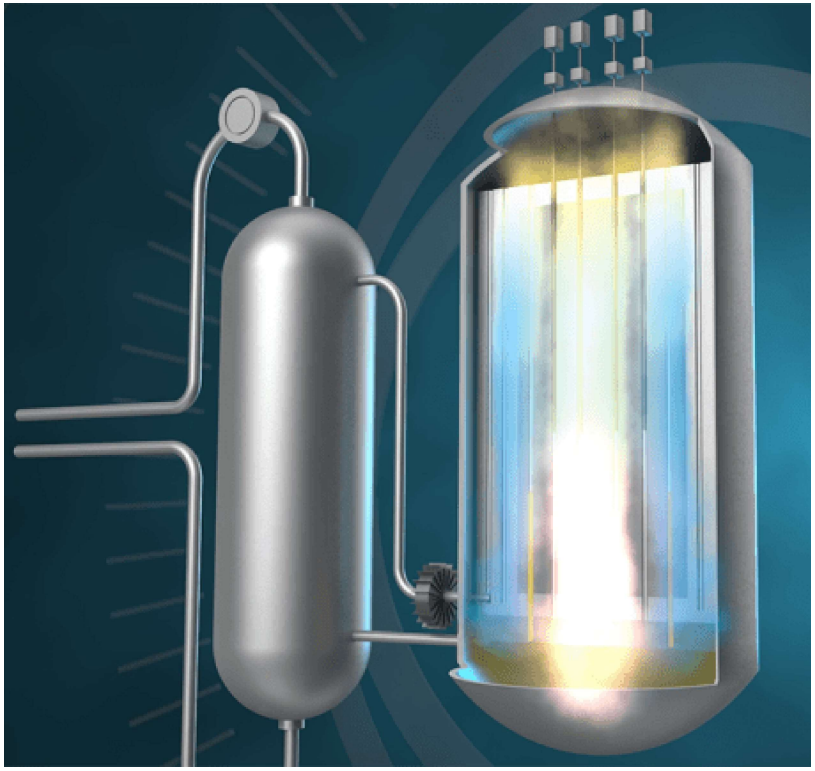
Division 5 – High Temperature Reactors

- Subsection HA – General Requirements
- Subsection HB – Class A Metallic Pressure Boundary Components
- Subsection HC – Class B Metallic Pressure Boundary Components
- Subsection HF – Class A and B Metallic Supports
- Subsection HG – Class SM Metallic Core Support Structures
- Subsection HH – Class SN Nonmetallic Core Components

Appendices

Nuclear Code Case

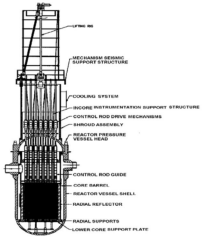
- Covers Section III and Section XI Cases



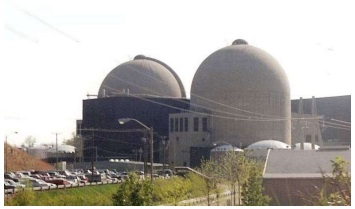
Summary of Scope of Section III Construction

Vessels

Valves



Metallic Core Support Structures

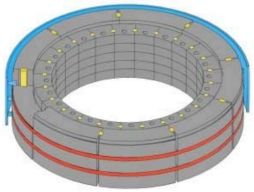


Concrete Containments
(Metal Containments also covered)

Piping

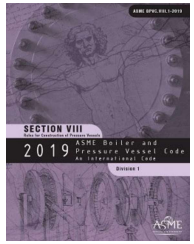
Storage Tanks

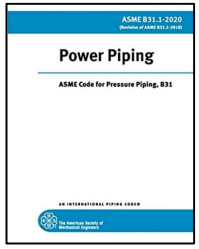
Pumps

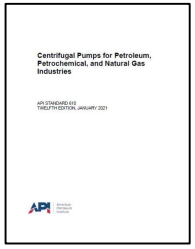


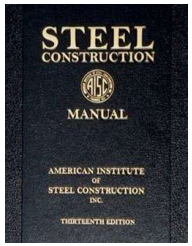
Non-Metallic Core Support Structures

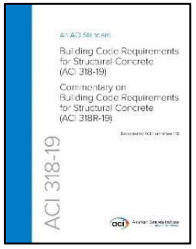
ASME and BPVC's Role in Industrial Facilities







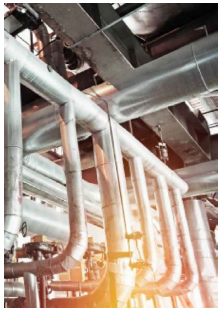




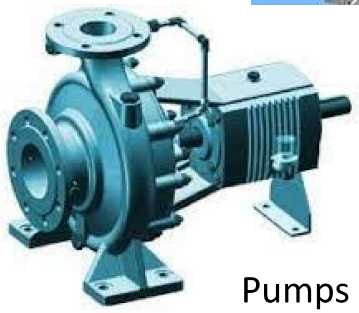
Vessels

Valves

Metal and Concrete Structures



Piping



Pumps

Definition of Section III Component Construction

General Requirements

- Process and Programmatic Controls
- Quality Assurance
- Independent Oversight
- Organization's ASME Code Responsibilities

Materials (-2000)

Design (-3000)

Fabrication (-4000)

Examination (Non-Destructive) (-5000)

Testing (Prior to Stamping) (-6000)

Overpressure Protection (-7000)

Certification and Stamping (-8000)

N, NA, NPT, NS

Upcoming Presentations

General Requirements

- Process and Programmatic Controls
- **Quality Assurance**
- **Independent Oversight**
- Organization's ASME Code Responsibilities

Materials (-2000)

Design (-3000)

Fabrication (-4000)

Examination (Non-Destructive) (-5000)

Testing (Prior to Stamping) (-6000)

Overpressure Protection (-7000)

Certification and Stamping (-8000)

N, NA, NPT, NS

ANY QUESTIONS?