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About the BPVC Since its first issuance in 1914, ASME’s Boiler and Pressure Vessel Code (BPVC) has pioneered modern standards-development, maintaining a commitment to enhance public safety and technological advancement to meet the needs of a changing world. More than 100,000 copies of the BPVC are in use in 100 countries around the world. Product Scope / Abstract This Division of Section VIII provides requirements applicable to the design, fabrication, inspection, testing, and certification of pressure vessels operating at either internal or external pressures exceeding 15 psig. Such pressure vessels may be fired or unfired. Specific requirements apply to several classes of material used in pressure vessel construction, and also to fabrication methods such as welding, forging and brazing. It contains mandatory and nonmandatory appendices detailing supplementary design criteria, nondestructive examination and inspection acceptance standards. Rules pertaining to the use of the U, UM and UV ASME Product Certification Marks are also included. Careful application of this Section will help users to comply with applicable regulations within their jurisdictions, while achieving the operational, cost and safety benefits to be gained from the many industry best-practices detailed within these volumes. Intended for manufacturers, users, constructors, designers and others concerned with the design, fabrication, assembly, erection, examination, inspection and testing of pressure vessels, plus all potential governing entities. Click here for a printer-friendly version of a Brochure, which details all 12 BPVC-2019 Sections, plus ASME’s portfolio of related BPVC offerings. Click here for a printer-friendly, Invoice-Request Form for pre-ordering. To the best of my knowledge, there is no maximum pressure limit defined by the code. Minimum pressure limits are defined in Paragraph U-1(c)(2)(h) as 15 psi. But it also has exceptions relative to service and diameter. I suggest reading U-1 in it's entirety for clarity. Hi friend, thanks for help....but in U-1 it says: == (h) vessels having an internal or external operating pressure (see 3-2) not exceeding 15 psi (100 kPa) with no limitation on size [see UG-28(f)]; == ?) what is meant by "(see 3-2)" here... ?) and it is normal practice that in almost all of cases (where vessels are above ground) we take external pressure as 15 psi or rather 14.7 psi; atomospheric case.... so is not it strange that this point will bring our vessel beyond ASME SEC VIII scope.. Thanks Any vessel with a design (or Maximum Allowable Working Pressure, MAWP) of 15 psig or higher falls within the ASME scope. Note the use of "g" in psig. If your vessel is designed for anything less than 15 psig, it does NOT fall within ASME Section VIII sope but may then fall within the various API standards, API 2000, API 650, API 620, etc. auba, Are you saying that your practice is to design an aboveground vessel for a full vacuum of 15 psi? Just for the record, at 15 psig, the vessel would not fall within pressure limits of the ASME Code, unless you chose to do so. The design pressures in ASME are psig, not psia. Steve Braune Tank Industry Consultants Need to clarify my previous post. To be a pressure vessel, the INTERNAL design pressure would actaully be anything GREATER than 15 psig (we typically make sure that we specifiy nothing greater than 14.9 psig so there is no question or interpretation). And if the INTERNAL pressure is anything greater than 15 psig, then it falls within ASME Section VIII scope. But if the internal pressure is only a vacuum consideration, then it does not necessarily fall within the scope. 3-2 refers to Appendix 3, paragraph 2. I'm not sure what you mean by your second question. Hi friends, i am cleared now for external pressure case as said in UG-28(f) == Vessels intended for service under external working pressures of 15 psi (0.1 MPa) and less [see U-1(c)(2)(h)] may be stamped with the Code Symbol denoting compliance with the rules for external pressure provided all the applicable rules of this Division are satisfied. When the Code Symbol is to be applied, the user or his designated agent shall specify the required maximum allowable external working pressure.16 The vessel shall be designed and stamped with the maximum allowable external working pressure. == SO EXTERNAL PREWSSURE OF 15 PSIG FALLS WITHING ASME SCOPE.. HOWEVER FOR INTERNAL PRESSURE I MUST GO ABOVE 15 PSIG IN ORDER TO BE WITHIN ASME SCOPE.. i hope i am right????? Thanks... Yes, your internal design pressure must be ANYTHING greater than 15 psig to fall within the Section VIII scope. Hi friend, so if my pressure vessel internal pressure is below 15 psig then to design it which code i should use... i mean what about pd5500 ot BS codes.... Thanks Where is this vessel destined to be installed, surely if you are not installing it in Europe then you do not need to look at British codes. A previous reply mentioned that the vessel may fall under one of the API codes. If you are in Europe then the internal pressure at which it falls into the PED (i.e is classed as a pressure vessel) is 0.5 Barg (not 15 psig like ASME) Hi friend, my vessel will be underground and will be placed in canada... my vessel is actually having 3 psi of internal pressure.. still confusing whether to use asme codes or not.. Thanks auba, I don't see why you are still confused. Several folks have laid it out there pretty plain...DESIGNED for under 15 psig and you are outside the bounds of ASME XIII div 1. I think the part you need to decide is determining the DESIGN pressure, not the OPERATING pressure, which I assume from your comments to be "3 psi". Being underground you are going to have to account for the external loading of the soil etc. Good luck. Brian The usual rule of thumb for vessels less than design pressure of 15 psig is to design, test, and inspect as per ASME Section VIII, but not to "register" it. Also, as it is going in Canada, be sure to refer to CSA B51-03, the Canadian vessel code. auba- Even if your vessel has a design internal pressure of 3 psig, you may, at your option, design, fabricate, and stamp it per VIII-1. That's made perfectly clear in the code: U-1(c)(2) Based on the Committee’s consideration, the following classes of vessels are not included in the scope of this Division; however, any pressure vessel which meets all the applicable requirements of this Division may be stamped with the Code U Symbol So, yes, while a vessel with strictly an external pressure design condition equal to or less than 15 psig is excluded from the scope, you may still stamp it. This is commonly done, though usually the MAWP (internal) is greater than 15 psig. On the other hand, if you choose, you may design and fabricate to VIII-1, but not U stamp the vessel. Or perhaps API-620 (I don't have it handy so can't check the scope). As mentioned in previous posts, check (i.e. in writing!) with the jurisdiction in which the vessle will be installed before you commit to any particular code or standard. jt From a practical point of view, it appears that it may be better to design the vessel to withstand 15 psi internal, and 15 psi external pressure; though the operating pressure may fall between these two values. In such a case, there is no doubt a little over-design, but Code compliance will not be an issue. This is not too uneconomical in general. In fact, this stems from an observation of a majority of client specifications. Where is the 15 psig measurement taken? Do you have to take static head into account? We're looking at building a tank that'll be either atmospheric or very slightly positive pressure in the vapor space. The bottom might approach 15 psi when full. If that's a concern, we'll go wider and shorter then. Thanks. @CaptainKidd: I would take everything into account, including static head, yes. "...might approach 15 psi..." apparently, you are talking about the operating pressure. There's every reason to consider 15 + 1.5 psi for the design then. As for the L/D, there are several other factors to consider such as piping and nearby equipment. Per ASME, Section VIII, Division 1, Section UG-98, you the specifier are only take into account the top of the vessel in its normal operating position. When the vessel is designed by the manufacturer, they must take into account the maximum liquid density and height so that they can account for these in determining the necessary thickness of metal at the vessel's bottom. CaptainKidd, The 15 psi is considerted at the top of the vessel/tank in it's normal operating position. In the case of a tank with an open vent or gas pressure not exceeding 15 psi, the tank would not fall under the rules of ASME. FYI... API Standard 620 covers tanks upto 15 psi design pressures. Steve Braune Tank Industry Consultants Technical standard The ASME Boiler & Pressure Vessel Code (BPVC) is an American Society of Mechanical Engineers (ASME) standard that regulates the design and construction of boilers and pressure vessels.[1] The document is written and maintained by volunteers chosen for their technical expertise .[2] The ASME works as an accreditation body and entitles independent third parties (such as verification, testing and certification agencies) to inspect and ensure compliance to the BPVC.[3] The BPVC was created in response to public outcry after several serious explosions in the state of Massachusetts. A fire-tube boiler exploded at the Grover Shoe Factory in Brockton, Massachusetts, on March 20, 1905, which resulted in the deaths of 58 people and injured 150. Then on December 6, 1906, a boiler in the factory of the P.J. Harney Shoe Company exploded in Lynn, Massachusetts. As a result, the state of Massachusetts enacted the first legal code based on ASME's rules for the construction of steam boilers in 1907.[4][5] ASME convened the Board of Boiler Rules before it became the ASME Boiler Code Committee which was formed in 1911. This committee put in the form work for the first edition of the ASME Boiler Code - Rules for the Construction of Stationary Boilers and for the Allowable Working Pressures, which was issued in 1914 and published in 1915.[5] The first edition of the Boiler and Pressure Vessel Code, known as the 1914 edition, was a single 114-page volume.[6][7] It developed over time into the ASME Boiler and Pressure Vessel code, which today has over 92,000 copies in use, in over 100 countries around the world.[5] As of March 2011[update] the document consisted of 16,000 pages in 28 volumes.[7] After the first edition of the Code, the verifications required by the Code were performed by independent inspectors, which resulted in a wide range of interpretations. Hence in February 1919, the National Board of Boiler and Pressure Vessel Inspectors was formed.[5] ASME BPVC TIMELINE[5][8] This section needs to be updated. The reason given is: Table is extremely vague and only includes a subset of all changes to the code in each issue year. It would be better to either provide reference links to official documentation describing all changes between code versions, or perhaps to only show changes to the most recent code version.. Please help update this article to reflect recent events or newly available information. (April 2022) Year Activity 1880 The American Society of Mechanical Engineers is founded 1884 First performance test code: Code for the Conduct of Trials of Steam Boilers 1900 First revision of an ASME standard, Standard Method of Conducting Steam Boiler Tests 1911 Establishment of a committee to propose a Boiler Code 1913 New Committee to revise the Boiler Code 1914 Issuance of the first Boiler Code 1915 Standards for Specifications and Construction of Boilers and Other Containing Vessels in Which High Pressure is Contained 1919 National Board of Boiler and Pressure Vessel Inspectors formed 1924 Code for Unfired Pressure Vessels 1930 Test Code of Complete Steam-Electric Power Plants 1956 Committee established for ASME Pressure Vessel Code for Nuclear Age 1963 Section III (Nuclear Power) of ASME Boiler and Pressure Vessel Code 1968 ASME Nuclear Power Certificate of Authorization Program commences 1972 ASME expands its certification program worldwide; first ASME manufacturer certification issued outside of North America 1978 First ASME publication of Boiler and Pressure Vessel Committee interpretations 1983 ASME Boiler and Pressure Vessel Code published in both conventional and metric units 1989 Boiler and Pressure Vessel Code published on CD-ROM 1992 First Authorized Inspection Agency accredited 1996 Risk technology introduced into the Boiler and Pressure Vessel Code 1997 High Pressure Vessel Code 2000 C&S Connect (on-line balloting and tracking system) launched for Boiler and_Pressure Vessel Committees 2007 ISO TC11 Standard 16528—Boilers and Pressure Vessels published, establishing performance requirements for the construction of boilers and pressure vessels and facilitating registration of BPV Codes to this standard 2007 High density polyethylene plastic pipe introduced into the Boiler and Pressure Vessel Code, Section III, Code Case N-755 2009 ASME Boiler and Pressure Vessel Committee reorganized from one consensus body to ten consensus bodies 2015 High density polyethylene plastic pipe incorporated into Boiler and Pressure Vessel Code, Section III, Mandatory Appendix XXVI LIST OF SECTIONS[9] The following is the structure of the 2021 Edition of the BPV Code:[10] ASME BPVC Section I - Rules for Construction of Power Boilers ASME BPVC Section 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) ASME BPVC Section 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 & Transport Packagings for Spent Nuclear Fuel &High Level Radioactive Waste Division 5 - High Temperature Reactors 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 Division 1 - Rules for Construction of Pressure Vessels Division 2 - Alternative Rules Division 3 - Alternative Rules for Construction of High Pressure Vessels ASME BPVC Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators ASME BPVC Section X - Fiber-Reinforced Plastic Pressure Vessels ASME BPVC Section 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 ASME BPVC Section XII - Rules for the Construction and Continued Service of Transport Tanks ASME BPVC Section XIII - Rules for Overpressure Protection ASME BPVC Code Cases - Boilers and Pressure Vessels ADDENDA Addenda, which include additions and revisions to the individual Sections of the Code, are issued accordingly for a particular edition of the code up until the next edition.[9] Addenda is no longer in use since Code Edition 2013. It has been replaced by two years edition period. INTERPRETATIONS ASME's interpretations to submitted technical queries relevant to a particular Section of the Code are issued accordingly. Interpretations are also available through the internet.[11] CODES CASES Code Cases provide rules that permit the use of materials and alternative methods of construction that are not covered by existing BPVC rules.[12] For those Cases that have been adopted will appear in the appropriate Code Cases book: "Boilers and Pressure Vessels" and "Nuclear Components."[9] Codes Cases are usually intended to be incorporated in the Code in a later edition. When it is used, the Code Case specifies mandatory requirements which must be met as it would be with the Code. There are some jurisdictions that do not automatically accept Code Cases.[9] It has been suggested that this section be split out into another article titled ASME BPVC Section II - Materials. (Discuss) (March 2023) The section of the ASME BPVC consists of 4 parts. Part A - Ferrous Material Specifications This Part is a supplementary book referenced by other sections of the Code. It provides material specifications for ferrous materials which are suitable for use in the construction of pressure vessels.[13] The specifications contained in this Part specify the mechanical properties, heat treatment, heat and product chemical composition and analysis, test specimens, and methodologies of testing. The designation of the specifications start with 'SA' and a number which is taken from the ASTM 'A' specifications.[13] Part B - Nonferrous Material Specifications This Part is a supplementary book referenced by other sections of the Code. It provides material specifications for nonferrous materials which are suitable for use in the construction of pressure vessels.[13] The specifications contained in this Part specify the mechanical properties, heat treatment, heat and product chemical composition and analysis, test specimens, and methodologies of testing. The designation of the specifications start with 'SB' and a number which is taken from the ASTM 'B' specifications.[13] Part C - Specifications for Welding Rods, Electrodes, and Filler Metals This Part is a supplementary book referenced by other sections of the Code. It provides mechanical properties, heat treatment, heat and product chemical composition and analysis, test specimens, and methodologies of testing for welding rods, filler metals and electrodes used in the construction of pressure vessels.[13] The specifications contained in this Part are designated with 'SFA' and a number which is taken from the American Welding Society (AWS) specifications.[13] Part D - Properties (Customary/Metric) This Part is a supplementary book referenced by other sections of the Code. It provides tables for the design stress values, tensile and yield stress values as well as tables for material properties (Modulus of Elasticity, Coefficient of heat transfer et al.)[13] It has been suggested that this section be split out into another article titled ASME BPVC Section III - Rules for Construction of Nuclear Facility Components. (Discuss) (March 2023) Section III of the ASME Code Address the rules for construction of nuclear facility components and supports. The components and supports covered by section III are intended to be installed in a nuclear power system that serves the purpose of producing and controlling the output of thermal energy from nuclear fuel and those associated systems essential to safety of nuclear power system. Section III provides requirements for new construction of nuclear power system considering mechanical and thermal stresses due to cyclic operation. Deterioration, which may occur in service as result of radiation effects, corrosion, or instability of the material, is typically not addressed. Subsection NCA (General Requirements for Division 1 and Division 2) NCA-1000 Scope of Section III NCA-2000 Classification of Components and Supports NCA-3000 Responsibilities and Duties NCA-4000 Quality Assurance NCA-5000 Authorized Inspection NCA-8000 Certificates, Nameplates, Code Symbol Stamping, and Data Reports NCA-9000 Glossary Division 1- Metallic Components Subsection NB Class 1 components (Those components that are part of the fluid-retaining pressure boundary of the reactor coolant system. Failure of this pressure boundary would violate the integrity of the reactor coolant pressure boundary) Reactor Pressure Vessel Pressurizer Vessel Steam Generators Reactor Coolant Pumps Reactor Coolant Piping Line Valves Safety Valves Subsection NC Class 2 components (Those components that are not part of the reactor coolant pressure boundary, but are important for reactor shutdown, emergency core cooling, post-accident containment heat removal, or post-accident fission product removal) Emergency Core Cooling Post Accident Heat Removal Post Accident Fission Product Removal Includes Vessels, Pumps, Valves, Piping, Storage Tanks, and Supports Subsection ND Class 3 components (Those components that are not part of class 1 or 2 but are important to safety) Cooling Water Systems Auxiliary Feedwater Systems Includes Vessels, Pumps, Valves, Piping, Storage Tanks, and Supports Subsection NE Class MC supports Containment Vessel Penetration Assemblies (Does not include piping, pumps and valves which if passing through the containment must be class 1 or class 2) Subsection NF Supports Plate and Shell Type Linear Type Standard Supports Support Class is the class of the Component Supported Subsection NG Core Support Structures (class CS) Core Support Structures Reactor Vessel Internals Subsection NH Class 1 Components in Elevated Temperature Service (Those components that are used in elevated temperature service) Elevated Temperature Components Service Temperature over 800°F Appendices[14] This section needs expansion. You can help by adding to it. (March 2023) This section of the ASME BPVC contains the requirements for nondestructive examinations which are referred and required by other sections of the Code.[15] It also covers the suppliers examination responsibilities, requirements of the authorized inspectors (AI) as well as the requirements for the qualification of personnel, inspection and examinations.[15][16] It has been suggested that this section be split out into another article titled ASME BPVC Section VIII - Rules for Construction of Pressure Vessels. (Discuss) (March 2023) This section of the ASME BPVC consists of 3 divisions.[17] Div. 1 covers the mandatory requirements, specific prohibitions and nonmandatory guidance for materials, design, fabrication, inspection and testing, markings and reports, overpressure protection and certification of pressure vessels having an internal or external pressure which exceeds 15 psi (100 kPa).[9] Pressure vessels covered by this division can be either fired or unfired.[17] The pressure may be from external sources, or by the application of heating from an indirect or direct source, or any combination thereof.[9] The division is not numbered in the traditional method (Part 1, Part 2 etc.) but is structured with Subsections and Parts which consist of letters followed by a number. The structure is as follows:[9] Subsection A - General Requirements Part UG - General Requirements for All Methods of Construction and All Materials Materials: UG-4 through to UG-15 Design: UG-16 through to UG-35 Openings and Reinforcements: UG-36 through to UG-46 Braced and Stayed Surfaces: UG-47 through to UG-50 Fabrication: UG-75 through to UG-85 Inspection and Tests: UG-90 through to UG-103 Marking and Reports: UG-115 through to UG-120 Overpressure Protection: UG125 through to UG-140 Subsection B - Requirements Pertaining to Methods of Fabrication of Pressure Vessels Part UW - Requirements for Pressure Vessels Fabricated by Welding General: UW-1 through to UW-3 Materials: UW-5 Design: UW-8 through to UW-21 Fabrication: UW-26 through to UW-42 Inspection and Tests: UW-46 through to UW-54 Marking and Reports: UW-60 Pressure Relief Devices: UW-65 Part UF - Requirements for Pressure Vessels Fabricated by Forging General: UF-1 Materials: UF-5 through to UF-7 Design: UF-12 through to UF-25 Fabrication: UF-26 through to UF-43 Inspection and Tests: UF-45 through to UF-55 Marking and Reports: UF-115 Pressure Relief Devices: UF-125 Part UB - Requirements for Pressure Vessels Fabricated by Brazing General: UB-1 through to UB-3 Materials: UB-5 through to UB-7 Design: UB-9 through to UB-22 Fabrication: UB-30 through to UB-37 Inspection and Tests: UB-40 through to UB-50 Marking and Reports: UB-55 Pressure Relief Devices: UB-60 Subsection C - Requirements Pertaining to Classes of Materials Part UCS - Requirements for Pressure Vessels Constructed of Carbon and Low Alloy Steels General: UCS-1 Materials: UCS-5 through to UCS-12 Design: UCS-16 through to UCS-57 Low Temperature Operation: UCS-65 through to UCS-68 1:* Fabrication: UCS-75 through to UCS-85 Inspection and Tests: UCS-90 Marking and Reports: UCS-115 Pressure Relief Devices: UCS-125 Nonmandatory Appendix CS: UCS-150 through to UCS-160 Part UNF - Requirements for Pressure Vessels Constructed of Nonferrous Materials General: UNF-1 through to UNF-4 Materials: UNF-5 through to UNF-15 Design: UNF-16 through to UNF-65 Fabrication: UNF-75 through to UNF-79 Inspection and Tests: UNF-90 through to UNF-95 Marking and Reports: UNF-115 Pressure Relief Devices: UNF-125 Appendix NF: Characteristics of the Nonferrous Materials (Informative and Nonmandatory) Part UHA Requirements for Pressure Vessels Constructed of High Alloy Steel General: UHA-1 through to UHA-8 Materials: UHA-11 through to UHA-13 Design: UHA-20 through to UHA-34 Fabrication: UHA-40 through to UHA-44 Inspection and Tests: UHA-50 through to UHA-52 Marking and Reports: UHA-60 Pressure Relief Devices: UHA-65 Appendix HA: Suggestions on the Selection and Treatment of Austenitic Chromium–Nickel and Ferritic and Martensitic High Chromium Steels (Informative and Nonmandatory) Part UCI - Requirements for Pressure Vessels Constructed of Cast Iron General: UCI-1 through to UCI-3 Materials: UCI-5 through to UCI-12 Design: UCI-16 through to UCI-37 Fabrication: UCI-75 through to UCI-78 Inspection and Tests: UCI-90 through to UCI-101 Marking and Reports: UCI-115 Pressure Relief Devices: UCI-125 Part UCL - Requirements for Welded Pressure Vessels Constructed of Material With Corrosion Resistant Integral Cladding, Weld Metal Overlay Cladding, or With Applied Linings General: UCL-1 through to UCL-3 Materials: UCL-10 through to UCL-12 Design: UCL-20 through to UCL-27 Fabrication: UCL-30 through to UCL-46 Inspection and Tests: UCL-50 through to UCL-52 Marking and Reports: UCL-55 Pressure Relief Devices: UCL-60 Part UCD - Requirements for Pressure Vessels Constructed of Cast Ductile Iron General: UCD-1 through to UCD-3 Materials: UCD-5 through to UCD-12 Design: UCD-16 through to UCD-37 Fabrication: UCD-75 through to UCD-78 Inspection and Tests: UCD-90 through to UCD-101 Marking and Reports: UCD-115 Pressure Relief Devices: UCD-125 Part UHT Requirements for Pressure Vessels Constructed of Ferritic Steels With Tensile Properties Enhanced by Heat Treatment. General: UHT-1 Materials: UHT-5 through to UHT-6 Design: UHT-16 through to UHT-57 Fabrication: UHT-75 through to UHT-86 Inspection and Tests: UHT-90 Marking and Reports: UHT-115 Pressure Relief Devices: UHT-125 Part ULW Requirements for Pressure Vessels Fabricated by Layered Construction Introduction: ULW-1 through to ULW-2 Materials: ULW-5 Design: ULW-16 through to ULW-26 Welding: ULW-31 through to ULW-33 2:* Nondestructive Examination of Welded Joints: ULW-50 through to ULW-57 Fabrication: ULW-75 through to ULW-78 Inspection and Tests: ULW-90 Marking and Reports: ULW-115 Pressure Relief Devices: ULW-125 Part ULT Alternative Rules for Pressure Vessels Constructed of Materials Having Higher Allowable Stresses at Low Temperature General: ULT-1 through to ULT-5 Design: ULT-16 through to ULT-57 Fabrication: ULT-76 through to ULT-86 Inspection and Tests: ULT-90 through to ULT-100 Marking and Reports: ULT-115 Pressure Relief Devices: ULT-125 Part UHX - Rules for Shell-and-Tube Heat Exchangers Part UIG - Requirements for Pressure Vessels Constructed of Impregnated Graphite General: UIG-1 through to UIG-3 Materials: UIG-5 through to UIG-8 Design: UIG-22 through to UIG-60 Fabrication: UIG-75 through to UIG-84 Inspection and Tests: UIG-90 through to UIG-112 Marking and Reports: UIG-115 through to UIG-121 3:* Pressure Relief Devices: UIG-125 MANDATORY APPENDICES: 1 through to 48 NONMANDATORY APPENDICES: A through to PP This division covers the mandatory requirements, specific prohibitions and nonmandatory guidance for materials, design, fabrication, inspection and testing, markings and reports, overpressure protection and certification of pressure vessels having an internal or external pressure which exceeds 3000 psi (20700 kPa) but less than 10,000 psi.[18] The pressure vessels can be either fired or unfired.[17] The pressure may be from external sources, or by the application of heating from an indirect or direct source as a result of a process, or any combination of the two.[18] The rules contained in this section can be used as an alternative to the minimum requirements specified in Division 1. Generally the Division 2 rules are more onerous than in Division 1 with respect to materials, design and nondestructive examinations but higher design stress intensity values are allowed.[17] Division 2 has also provisions for the use of finite element analysis to determine expected stress in pressure equipment, in addition to the traditional approach of design by formula (Part 5: "Design by Analysis requirements"). This division covers the mandatory requirements, specific prohibitions and nonmandatory guidance for materials, design, fabrication, inspection and testing, markings and reports, overpressure protection and certification of pressure vessels having an internal or external pressure which exceeds 10,000 psi (70,000 kPa).[19] The pressure vessel can be either fired or unfired.[17] The pressure may be from external sources, by the application of heating from an indirect or direct source, process reaction or any combination thereof.[19] Pressure Equipment Directive List of welding codes EN 13445 PD 5500 Uniform Mechanical Code Uniform Plumbing Code ^ Antaki, George A. (2003). Piping and pipeline engineering: design, construction, maintenance, integrity, and repair. Marcel Dekker Inc. ISBN 9780203911150. ^ ASME Codes and Standards Archived February 14, 2010, at the Wayback Machine ^ Boiler and Pressure Vessel Inspection According to ASME ^ Balmer, Robert T (2010). Modern Engineering Thermodynamics. 13.10 Modern Steam Power Plants: Academic Press. p. 864. ISBN 978-0-12-374996-3.{{cite book}}: CS1 maint: location (link) ^ a b c d e Varrasi, John (June 2009). "To Protect and Serve - Celebrating 125 Years Of Asme Codes & Standards". MEMagazine. ^ Canonico, Domenic A. (February 2000). "The Origins of ASME's Boiler and Pressure Vessel Code". MEMagazine. ^ a b "The History of ASME's Boiler and Pressure Vessel Code". ASME. March 2011. Retrieved 24 July 2015. ^ "Standards and Certification Chronology". History of ASME Standards. ASME. Retrieved 10 November 2011. ^ a b c d e f g An International Code - 2010 ASME Boiler & Pressure Vessel Code Section VIII Rules for Construction of Pressure Vessels - Division 1. ASME. July 1, 2011. ^ "BPV Complete Code - 2021". ASME Boiler and Pressure Vessel Code - 2021 Edition. ASME. Retrieved April 4, 2022. ^ "Codes & Standards Interpretations On-Line". Codes and Standards Electronic Tools. ASME International. Retrieved 10 November 2011. ^ "Code Cases of the ASME Boiler and Pressure Vessel Code". ASME. Archived from the original on 18 July 2012. Retrieved 7 November 2011. ^ a b c d e f g "II. Materials". Boiler and Pressure Vessel Code - 2010 Edition. ASME. Archived from the original on 10 October 2011. Retrieved 9 November 2011. ^ § ^ a b "V. Nondestructive Examinations". Boiler and Pressure Vessel Code - 2010 Edition. ASME. Retrieved 9 November 2011. ^ §§§§ ^ a b c d e "VIII. Pressure Vessels - Division 1". Boiler and Pressure Vessel Code - 2010 Edition. ASME. Retrieved 9 November 2011. ^ a b An International Code - 2010 ASME Boiler & Pressure Vessel Code Section VIII Rules for Construction of Pressure Vessels - Division 2: Alternative Rules. ASME. July 1, 2011. ^ a b An International Code - 2010 ASME Boiler & Pressure Vessel Code Section VIII Rules for Construction of Pressure Vessels - Division 3: Alternative Rules for Construction of High Pressure Vessels. ASME. July 1, 2011. 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