



Pressure Points

Risk Solutions

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Governing Code Section VIII Division 1 – 2017 Edition

The governing Code Edition for pressure vessels is established in ASME Section VIII Division 1, Mandatory Appendix 43. This article addresses construction of these three different categories of pressure vessels:

1. Pressure Vessels and Subcontracted Parts
2. Stock Parts
3. Identical Replacement Parts

Pressure Vessels and Subcontracted Parts

Section VIII Division 1 uses the vessel contract date to determine the governing Code Edition for construction of the entire pressure vessel, including subcontracted parts. Contract date is not thoroughly defined in Section VIII, however, Interpretation BPV VIII-1-16-49* clarifies that commercial and technical agreements that may have been made prior to the actual contract date cannot lock in an earlier Code Edition for construction. Appendix 43-2(a)(2) includes the provision that a subcontracted part shall also be constructed to the Code Edition established for the entire vessel.

Example 1: A vessel is contracted in early 2018, so the mandatory Code Edition is ASME Section VIII Division 1, 2017 Edition. The production is delayed, and the vessel Manufacturer does not place the order for a subcontracted Code stamped part until 2020. The vessel Manufacturer specifies the 2017 Code Edition to the part Manufacturer. Can the part Manufacturer certify the part to the 2017 Code Edition of Section VIII Division 1 even though they are constructing the part in 2020?

Answer: Yes. See Appendix 43-2(a)(2) and Interpretation BPV VIII-1-16-84* Question 1. For the subcontracted part of a vessel, the part Manufacturer shall construct the part to the Code Edition established for the entire vessel.



Stock Parts

Parts for stock shall be built and stamped the Code Edition at the time of Code certification, and then placed in stock as a finished part. It is important to note that the governing Code Edition for these stock items is “at time of certification” and the term “contract date” is not used in Appendix 43-2(a)(3). At the time of construction, a stock part would not have an external contract date from the purchaser of the part, and would not be dependent on the governing Code Edition for the entire vessel.

Section VIII Division 1, 43-2(a)(3) and 43-2(a)(4), permits a vessel Manufacturer to use these stock parts certified to an earlier or later Code Edition and Addenda than the governing Code Edition for the complete vessel. The vessel Manufacturer must ensure that the part fully satisfies all applicable Code requirements of the Code Edition used for construction of the complete vessel.

Example 2: A vessel is contracted in early 2018, so the mandatory Code Edition for the vessel is Section VIII Division 1, 2017 Edition. The vessel Manufacturer is able to find a part Manufacturer that stocks the part needed. The part to be purchased is certified to the 2015 Edition. Can the vessel Manufacturer use this part?

Answer: Yes, see Appendix 43-2(a)(4). The vessel Manufacturer shall ensure the part fully satisfies the applicable rules of the 2017 Code that is used for construction of the completed vessel.

Identical Replacement Parts

Section VIII Division 1 does not include any provision for replacement parts. In order to produce an in-kind replacement part for an existing pressure vessel under Section VIII Division 1 rules, the part Manufacturer is able to build the geometrically identical “built to print” part without assuming the design responsibility as indicated in UG-120(c)(1)(-b). By doing this, the part will be a geometric duplicate replacement part, but the part will need to be certified to the Code Edition at time of contract for the part, with the Manufacturers Partial Data Report indicating “design by others” under Remarks.

Example 3: In early October 2017, a vessel part Manufacturer receives an order for an existing vessel that was built to the 2013 Edition needs an in-kind replacement part. Can the part Manufacturer certify this part to the 2013 Code Edition?

Answer: No, the Code Edition that is mandatory at time of contract for this part is Section VIII Division 1, 2015 Edition and the part Manufacturer has the option of using the 2017 Edition. This replacement part is not considered a subcontracted part as listed under 43-2(a)(2) because this is for a vessel that is already placed in service. The part Manufacturer can, however, make a part that is a geometric duplicate with no design responsibility, and ensuring that all other aspects of construction of the part meet the 2015 Edition Section VIII Division 1.

*ASME Interpretations can be found at <http://go.asme.org/Interpretations>

Ask the Engineer

Question: Does NCA-3800/4200 require the user to meet NQA-1?

Answer: No, they have to have a program that meets the requirements of NCA-3800/4200, however they can base the program off of a NQA-1 program with modification.

Also, a Certificate Holder may supply material when stated in the scope of its Certificate and is not required to have a separate Quality System Program, providing the requirements listed in NCA-3830(a) through (f) are addressed in the N Certificate Holder's NCA-4000 program (Interpretation III-1-04-30).

Question: Do material providers providing Safety Related material have to meet NQA-1?

Answer: Yes, they must have a program that meets 10CFR50 APP B. This can be done by meeting NQA-1 or Commercial Grade Dedication.

If the buyer's QA program allows ASME Section III, NCA-3800/4200 as a consensus standard then the Materials Organization can follow NCA-3855.5/4255.5 to upgrade the unqualified source material for their NQA-1 application. Revision 2 and 3 of NRC Information Notice 86-21 also endorses Quality System Certificate holders as meeting the programmatic requirements of 10CFR50 APP B.

Hartford Steam Boiler Notified Body Services Not at Risk with Brexit

United Kingdom (UK) and European Union officials have formally begun the process of Britain's withdrawal from European Union (EU) membership. On 29 March 2017, the UK triggered Article 50 of the Lisbon Treaty, giving notice of their intention to leave the EU.

Hartford Steam Boiler (HSB) remains fully committed to providing Notified Body Services and will ensure that seamless services are provided regardless of the final Brexit outcome. We recognize the potential implications of Brexit on the Pressure Equipment Directive 2014/68/EU for the manufacturing sector. Hartford Steam Boiler is keeping in touch with industry bodies / government department / accreditation authorities to ensure we have the correct information to make any needed decisions in a timely manner. Whatever the outcome of the Brexit negotiations may be, HSB will support you throughout the process.

In the event that the UK is no longer allowed to operate its own EU Notified Bodies, Hartford Steam Boiler will maintain accreditation through another EU country.

Myth: Britain has already left the EU. Article 50 is a minimum two years notice, the earliest Britain can leave the EU is 29 March 2019.

Myth: Britain is leaving Europe. Britain has given notification to leave the EU, not Europe. There are several European countries who are not EU Members (Switzerland, Iceland, Norway).

Myth: A Notified Body needs to be in an EU Member State. Mutual Recognition Agreements (MRAs) exist between certain nations giving the equivalent status of Non-EU Nations within a defined scope.

Brexit - Notification Bodies Possible Outcomes

- Several non-EU countries are permitted to have Pressure Equipment Notified Bodies within them via the use of MRAs:
 - European Economic Area (EEA)/European Free Trade Association (EFTA) countries have standard MRAs (Norway, Iceland, etc.)
 - Switzerland has a special MRA
 - Turkey has an MRA in the form of a special customs agreement
- World Trade Organization (WTO) rules: the UK falls back on WTO rules and UK Notified Bodies no longer have a role in regulated product conformity assessment across the EU/EEA. Products must be re-certified to enter the EU market from the UK, as any other "third" country.
- Full recognition: UK Notified Bodies are still recognized in the EU/EEA and the UK plays a partial role in determining regulatory policy. This would be similar to that of the non-EU/EEA members such as Norway or Iceland.
- Free Trade Agreement (FTA) with mutual recognition of regulated conformity assessment:
 - UK Notified Bodies would meet UK requirements and would be sufficient to meet EU requirements

HSB will provide updates as more information becomes available.

Regarding Section VIII, Division 1 U-1(d)

Background:

VIII-1 Code Paragraph

U-1(d) The rules of this Division have been formulated on the basis of design principles and construction practices applicable to vessels designed for pressures not exceeding 3,000 psi (20 MPa). For pressures above 3,000 psi (20 MPa), deviations from and additions to these rules usually are necessary to meet the requirements of design principles and construction practices for these higher pressures.

Question:

How does one interpret the phrase "deviations from and additions to the rules" when designing a Section VIII-1 pressure vessel with design pressure over 20MPa?

Reply:

There is no list of items to check when considering the design and fabrication of a vessel exceeding 3,000 psi (20 MPa) to Section VIII, Division 1. However, based on numerous past requests, we can offer the following advice:

The 3,000 psi (20 MPa) number in U-1(d) is a conservative limit which is intended to alert the designer to the fact that the design principles upon which the Code is based may not be satisfactory (from a manufacturing or economic point of view) for the design of high pressure vessels. The design rules of Section VIII, Division 1 are based on elastic behaviour of thin shells in which failure is assumed to occur when the yield point is reached. According to a survey that was made, pressure vessels up to 10,000 psi (70 MPa) can be constructed to Section VIII, Division 1 without suffering a manufacturing or economic hardship.

In most cases for pressures under 5,000 psi (35 MPa), special design considerations would probably not be necessary. As a minimum you should check that the thin shell equations of UG-27 are valid (See UG-27(c)(1)), and check if fatigue loads need to be considered per UG-22.

To summarize, U-1(d) places no limit on the pressure for which a vessel may be designed and stamped according to Section VIII, Division 1. The paragraph alerts designers that for pressures greater than 3000 psi, design procedures unique to the design of high pressure equipment may be needed to meet the service requirements of the vessel. However, the Code symbol stamp may only be placed on the completed vessel if all of the requirements of the Code have been met.

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Hartford Steam Boiler
One State Street
Hartford, CT 01141-0299

Editor:
Stephen McKelvey

Contributors:
Paul Coco, Codes and Standards
Julie Hoskinson, Codes and Standards
Jayaram Vattappilly, Codes and Standards

GetInfo@HSB.com