



Risk Solutions

Pressure Points

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Governing Code Edition Section I - 2017

The governing Code Edition for boilers is established in ASME Section I, Mandatory Appendix VI. This article highlights the requirements for establishing the mandatory Code Edition for Section I, in addition to providing a brief comparison to governing Code Edition requirements in Section VIII Division 1. Boiler parts will be divided into these three basic categories:

1. Subcontracted Parts
2. Stock Parts
3. Identical Replacement Parts

It is important to note that Section I and Section VIII Division 1 establish the mandatory Code Edition for construction differently. A Code user needs to first recognize that Section VIII Division 1 bases the governing Code Edition on overall construction of the vessel or part. Section I, Mandatory Appendix VI, does not establish one governing Code Edition for all construction. Instead, the requirements for governing Code Edition are split into the following construction activities: design, materials, fabrication, examination, inspection, testing, over pressure protection, field assembly and certification. As a result, boilers and parts thereof are certified to the governing edition used for design



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as established by Appendix VI. However, certain construction activities such as fabrication, examination and field assembly can be performed in accordance with either the governing edition used for design or the edition and addenda approved and issued at the time the activity is performed.

For pressure-containing parts, the Manufacturer shall use material conforming to one of the specifications listed as approved for use in the Edition and Addenda specified for design. Also, the material specification edition must be listed as approved for use in the Guideline for Acceptable ASTM Editions or in the Guideline for Acceptable Non-ASTM Editions in Section II, Part A or Part B.

Subcontracted Parts

Section I, Mandatory Appendix VI-2 states that the Manufacturer of the completed boiler shall establish the Code Edition for **design** based on the boiler contract date. For parts of this boiler, the part Manufacturer (or subcontractor) shall use the Code Edition for design as directed by the boiler Manufacturer which is based on the boiler contract date.

Stock Parts

Parts for stock are often built without a contract from the boiler Manufacturer. Because of this, the part is designed to the mandatory Code Edition at the time of construction, and then certified and placed in stock as a finished part. These parts from stock may be used provided they are acceptable to the boiler Manufacturer.

Both Section I and Section VIII Division 1 permit the boiler or vessel Manufacturer to use these stock parts that have never been placed in service which are certified to an earlier or later Code Edition and Addenda than the governing Code Edition. Section I describes this in VI-2(b) and Section VIII-1 describes this in 43-2(a)(3) and 43-2(a)(4). The Manufacturer of the complete boiler or vessel must ensure that the part fully satisfies all applicable Code requirements of the governing Code Edition used for construction of the complete equipment.

Identical Replacement Parts

The Section I rules for identical replacement parts are different than those rules found in Section VIII Division 1. Section I allows for an identical replacement part to be certified to the Code Edition and Addenda established for an existing boiler in accordance with VI-2(c) of Appendix VI. This “in kind” replacement is defined as a part “identical in fit and material to the part being replaced”. Section VIII Division 1 does not permit certification to an older Code Edition to which the original equipment was certified.

Example: In early 2018 a contract is issued to a part Manufacturer for a part that is to be used for an existing boiler which was built to 2013 Edition of Section I. The part needed is an “in kind” replacement.

Question 1: Is it permitted for the part Manufacturer to certify this part to the Section I, 2013 Code Edition?

Answer 1: Yes. Section I allows this under Appendix VI-2(c)

Question 2: Is it permitted to certify this part to the 2017 Code Edition?

Answer 2: Yes, the 2017 Edition is mandatory at the time of contract for the replacement part.

Question 3: Is it permitted to certify this part to the 2015 Code Edition?

Answer 3: No, 2015 Edition is not used for the existing boiler, nor is the Code Edition mandatory at the time when the contract is placed for the replacement part.

Navigating the use of Small Products NX-2610

Many Code Users have used the provisions of NX-2610(b) for Small Product exemptions as an alternative to meeting the requirements of NCA-3800 for the procurement of "Small Products" as defined in NX-2610(c). Provided the requirements of NCA-3862 (for documentation), NCA-3856/4256 (for markings (NB only)) are met, Certificate Holders are permitted, in NX-2610(b), to establish measures in their quality assurance program to provide assurance that the furnished material meets the material specification and applicable subsection (i.e. NB, NC, ND) requirements.

One major common misconception of this provision is that code users see "Small Product," as a permitted use of commercial material without the need to perform any the of the NX-2000 requirements. This is not entirely the case, especially when looking at pipes, tubes (except heat exchanger tube), pipe fittings, NPS 2 (DN 50) and less. NB-2510 exempts examination requirements for the aforementioned product form at NPS 1 (DN 25) and less. All other product forms listed as "Small Products" as defined in NX-2610(c) are exempt from examinations.

Documentation is another issue for most Certificate Holders. NX-2610(b) allows Code users to furnish a Certificate of Compliance for pipe, tube (except heat exchanger tube), pipe fittings, material for pumps and valves with inlet pipe Connections, and flanges NPS 2 (DN 50) and less. This is inconsistent with NCA-3862(g) which allows code users to provide a Certificate of Compliance in lieu of a Certified Material Test Report (CMTR) for material NPS 3/4 and less for the same product form as described above. BPV III addressed this issue in Interpretation III-1-10-18, which in summary identified NCA-3862(g) as the prevailing requirements.

Per NCA-3862.1(a) a CMTR shall include the actual results of all required chemical analyses, tests, and examinations, whereas in NCA-3862.1(g), Certificate of Compliance includes material specification, grade, class, and heat treated condition, as applicable. Contrary to NX-2610(b) in situations where examination requirements are applicable in NX-2510 for pipes, tubes (except heat exchanger tube), pipe fittings, NPS 2 (DN 50) through NPS 1 (DN 25), only a CMTR would be able to document these examinations. Less than NPS 1 (DN 25) examinations are no longer required however a Certificate of Compliance is not permitted per NCA-3862(g) until the product is less the NPS 3/4.

Once a code user has navigated the web of examination requirements and the use of proper documentation, additional requirements beyond the code maybe applicable. If the Small Product has a non-Code safety related function, Commercial Grade Dedication is required if purchased from a commercial source. At a minimum the Certificate Holder would be required to have measures to assure the small product meets a material specification.

Until the code is corrected and has properly synced with NCA-3862, NX-2610, and NX-2510 code users should use caution in meeting provisions for examination and documentation in order to meet code requirements.

Pipe, tube (except heat exchanger tubes), pipe fittings, and flanges NPS 2 and less	NX-2610-CoC < 2 NPS CMTR for 3/4 <-> NPS 2 CoC for <3/4 NPS
Bolting material 1 in. nominal diameter and less	CoC
Bar 1 sq. in. nominal cross sectional area and less	CoC
Material for pumps and valves with inlet pipe connections NPS 2 nominal size and less	NX-2610-CoC < 2 NPS CMTR for 3/4 <-> NPS 2 CoC for <3/4 NPS
Materials exempted in NB-2121(c)	CoC

Interpretation: III-1-10-18

Subject: Section III, Division 1, NCA-3862.1(g), Material Certification; NB-2610, Documentation and Maintenance of Quality System Programs

Date Issued: February 12, 2010

File: 10-168

Question: Do the requirements contained in NB-2610 for certification of small products supersede those requirements stated in NCA-3862.1(g)?

Reply: No

Third Party Inspection – Levels of Service

Hartford Steam Boiler provides Third Party Inspection Services of pressure equipment built to a recognized code, standard, regulation or customer defined specification. Our worldwide staff of qualified, experienced National Board commissioned inspectors provide Third Party Inspection Services on behalf of manufacturers, end users, owners and contractors to verify pressure equipment compliance. We perform Third Party Inspection services for pressure equipment in many industries such as Petrochemical, Oil/Gas, Utilities, Pharmaceutical, LNG, Manufacturer, Mining, Pulp and Paper, and Food Processing.

Third Party Inspection Services offer the following, which can be customized to clients' requirements:

- Monitoring of fabrication, in whole or in part, from start to finish
- Witnessing of pressure tests
- Supplier and vendor surveillance
- Expediting
- Witnessing of material testing, evaluation and controls
- Design verification (including certification, where required)

Levels of Third Party Inspection of Pressure Equipment

HSB offers a flexible range of inspection services for pressure equipment. Four representative approaches are shown below:

	Level 1	Level 2	Level 3	Level 4
Design	●	●	◐	◑
Material	●	◐	◐	◑
Forming	●	◐		
Fabrication Inspection	●	◐	◐	
Welding	●	●	◐	◑
Post-Weld Heat Treatment (PWHT)	●	●	◐	
Nondestructive Examination (NDE)	●	◐	◐	◑
NCR	●	◐		
Final Visual Inspection	●	●	◐	◑
Pressure Test	●	◐	◐	◑
Marking and Labeling	●	◐		
Painting and Coating	●	●		
Shipping	●	●		

Legend: ● indicates varying degrees of inspection

Pressure equipment is generally built to a specific requirement or code of construction, such as ASME.

These requirements generally have established standards for conducting inspections throughout the design and fabrication process.

Third Party Inspections can be incorporated into these standards as a way for the end-user or customer to monitor the actions taken by the manufacturer.

Third party inspections can also be used to monitor different steps in the fabrication process that are not actually required by a code of construction or standard, but are still a concern for the end-user or customer and can be incorporated into the process by an Inspection Test Plan.

These Inspection Test Plans can be very complex or very simple, and with HSB we have developed levels that cover a wide range of requirements to make it easier for our customers to determine what level of detail they desire.

With Third Party Inspections there really are no external requirements or limitations as to how involved an Inspection Test Plan should be to provide the proper oversight and to ensure the end product meets the customer's requirements.

Inspection Test Plans are determined by the customer requesting these type of inspections, and should be involved enough to provide the oversight required to satisfy the customer or end-user, but not so involved that it drives the cost up with unnecessary inspections.

A properly prepared Inspection Test Plan will provide enough oversight to satisfy the customer's requirements and will help keep costs down by providing just the right amount of involvement to help prevent problems.



ASME Three-Day Seminar

Introduction to ASME Section VIII, Division 1 and ASME Section IX Seminar. The seminar will cover the following:

Material	Design	Fabrication	Welding
Requirements	Basic Design Philosophy	Overview	Requirements
Recertification	Design Equations for Common Shapes	Material Control	Welding Procedure Qualifications
Documentation	Openings and Reinforcements	Joint Preparation	Processes
Identification	Toughness	Postweld Heat Treatment	Welding Performance Qualifications
Pressure Testing, Manufacturer's Data Report and More			

Location	Dates
Framingham, MA	June 26 - 28, 2018
Charlotte, NC	September 18 - 20, 2018
St. Louis, Missouri	November 6 - 8, 2018

To Register: <https://bookstore.hsbct.com> or call 860-722-5061

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