

Conformity Assessment



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Board on Pressure Technology

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Industry Forum

Agenda

- ASME Conformity Assessment
 - ❖ Value Proposition Associated with Code Stamping
- Update on Section VIII, Division 2
 - ❖ Class 1 vs. Class 2



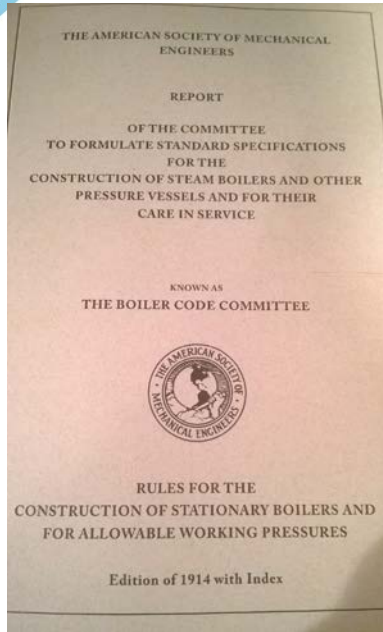
What Is ASME Conformity Assessment?



The recognition of a company's or individual's capability to fulfill the requirements of an ASME standard in order to advance public safety and facilitate international commerce.

Why ASME Conformity Assessment?

Understanding the need for oversight



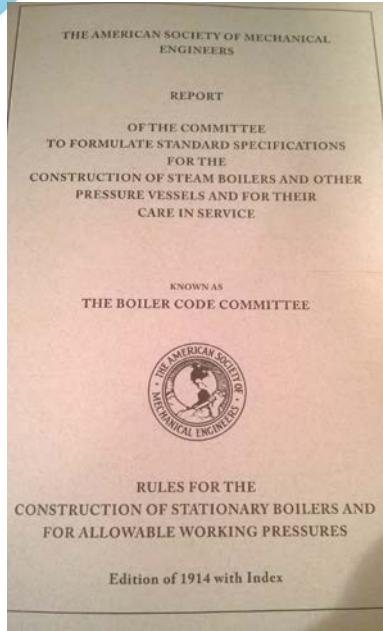
1914 Code – “The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchase is being performed... All tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified.

Part I Section I para. 61, (1914)

Though the Standard incorporates quality at its core it is a Safety Code

Why ASME Conformity Assessment?

The meaning behind Part I Section I para. 61



- Even in 1914, the Society, Code Committee Developers and Engineers determined the need for **oversight** of the manufacturing process
- **oversight** ensures that guiding principles of the code: high quality and commitment to public safety are met.

Evolution of Conformity Assessment


- As the industry grew, insurance companies with a stake in insuring manufactured boiler and pressure vessels assumed the role of inspection along with jurisdictional authorities.



Hartford Steam Boiler

Hartford Steam Boiler Inspection & Insurance Co. (HSB) has been an active participant on ASME BPV committees since 1914, and ASME's largest Authorized Inspection Agency

- Beginning of Third Party Inspection: an inspector independent of the manufacturer and the end purchaser.
- Objective: compliance to the code - *Safety*




“While protecting life and property is always the priority, from a quality standpoint, the ASME Code provides a framework for an organization to build consistent processes. It also provides a level playing field for all manufacturers, suppliers, and installers.”

ASME Certificate Holder

The International Mark of Safety and Quality: What to Look for

**Certification
Designator**

Certification Mark

	Certified by _____ Name of Manufacturer
	Pressure ____ at temperature ____ Max allowable working pressure
	Pressure ____ at temperature ____ Max allowable external working pressure [if specified; see Note (1)]
	Temperature ____ at pressure ____ Min. design metal temperature
	_____ Manufacturer's serial number _____ Year built

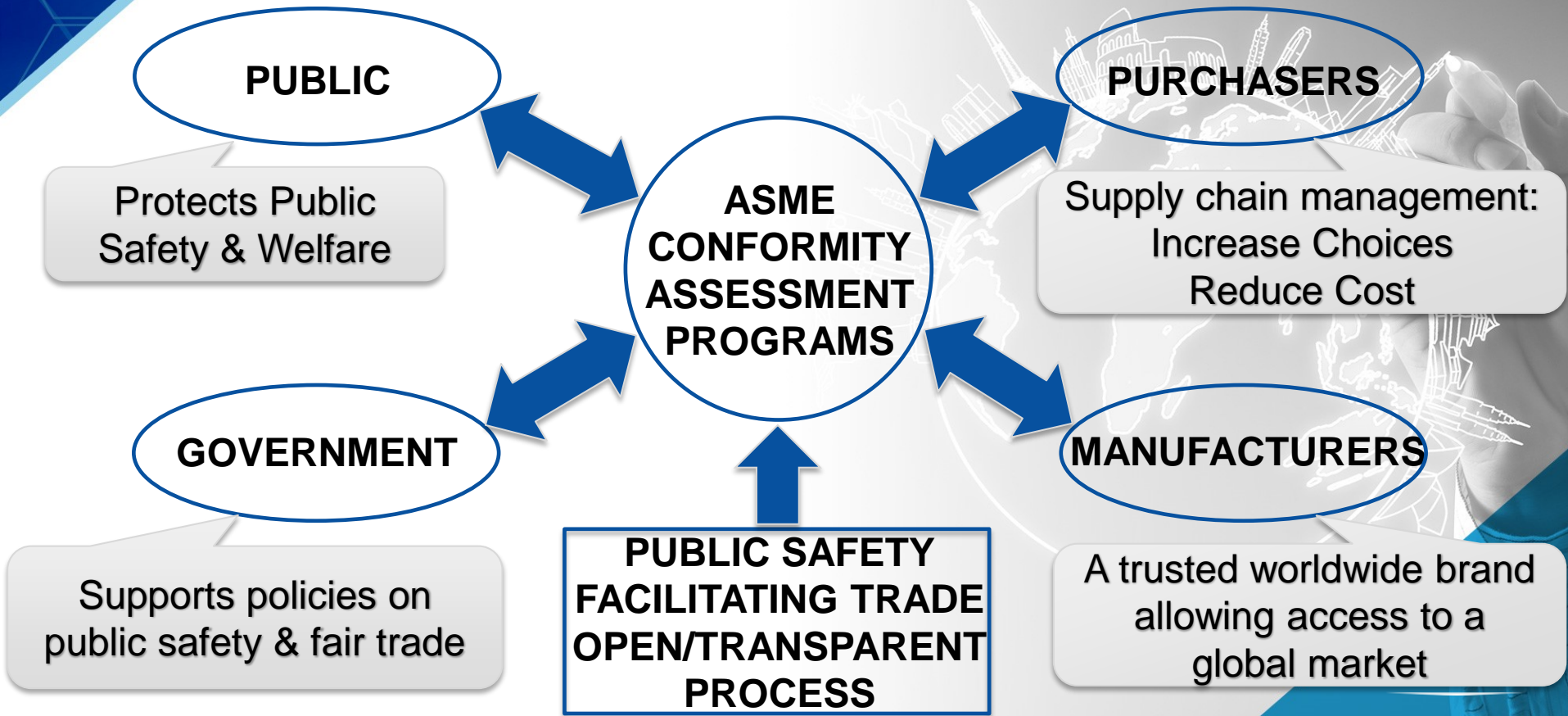
U2
W (if arc or gas welded)
RT (if radiographed)
HT (if postweld heat treated)

Why Become an ASME Certificate Holder?

P

- Should not be viewed as a cost burden but rather a tool to:
 - Cut cost through improved processes
 - Aid or facilitate clear understanding of the requirements between Supplier, Purchaser, Government, Public
 - Create a company culture centered around the achievement of quality
 - Demonstrate compliance/conformity to a regulation/standard
 - Advance public safety
 - Access new markets

Benefits ASME Certification



Why Conformity Assessment?

Conforming to the Standard	ASME Conformity Assessment
Suppliers Self-Declaration of Conformity	Accreditation and Certification
<i>“We bought the standard and follow it.”</i>	<i>“Our company went through a rigorous certification process designed to validate that we meet the standard.”</i>

Why Conformity Assessment?

Conforming to the Standard	ASME Conformity Assessment
Suppliers Self-Declaration of Conformity	Accreditation and Certification
<i>“We stand by the quality of our products”</i>	<i>“Through the Conformity Assessment process: ASME, the National Board, Jurisdictions and AIA’s stand behind the ASME Mark”</i>

What if you don't Stamp?

Why Certify?

- The ASME Code is clear and specific regarding requirements for equipment certified in accordance with the standard.
- In contrast, there is no clear definition of what is intended when equipment is specified as “fabricated or constructed to or in accordance with the ASME Code without stamping.”
 - Places burden of responsibility on user/purchaser to establish level of compliance via ITP

**"To Stamp or Not to Stamp" – NB Bulletin Summer 2012*

Cost is Key

- Nothing wrong with saving money, that's important.
- ***“If you're being promised equipment that's the same as “certified,” but at significant savings, you need to take a closer look at the fabricated equipment !!!”***
- Understanding the methods manufacturers use to cut costs is critical.
 - Actions can be taken to determine in advance which substitutions/sacrifices are acceptable ; *need to define what is meant by “ ... in accordance with ASME..”*
- We'll explore methods commonly used by manufacturers to reduce cost and present some real-world examples of risks and mitigation...

Ways for a Manufacturer to Cut Costs

Bypass Expensive Code Rqmt's

- Substitute inferior or less expensive materials
- Reduce in-process inspections
- Don't use qualified welders or procedures
- Misapply NDE (methods, extent, personnel qualifications)

Consequences

- Premature failure (owing to corrosion, cracking, etc)
- Production takes short cuts, failing to meet quality program
- Welding defects (often not visible w/o volumetric examination)
- Unidentified defects, particularly subsurface

Implications for unstamped products

- No third-party inspection by an Authorized Inspector(s)
- ASME Code may be used for design, but fabrication requirements are not verified
- ASME Code may be used for only some of the fabrication activities
- Manufacturer has not demonstrated implementation of an ASME-compliant Quality Control System

Implications for unstamped products

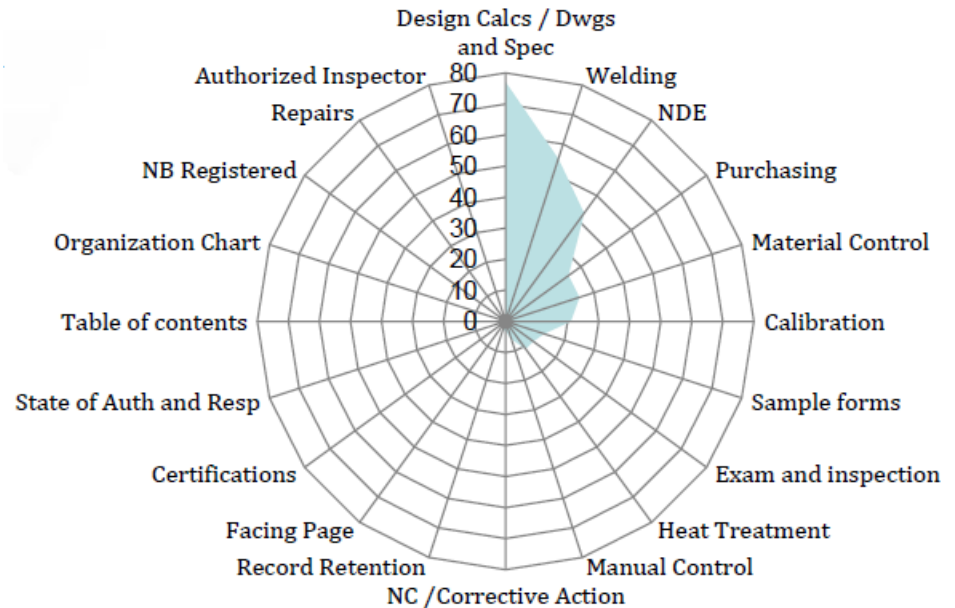
The end user accepts and in most cases, unknowingly accepts, all the risk of the manufactured pressure retaining item for an unstamped product.

Reality – Deficiencies Happen

Distribution of Findings from CH Audits

- This chart represents common findings for a Mfr. that holds an ASME Cert. (based on HSB data)
- Certificate Holder (CH) is given several months to prepare for ASME Audit
- QC Program content findings not represented on chart

Findings Distribution (%)

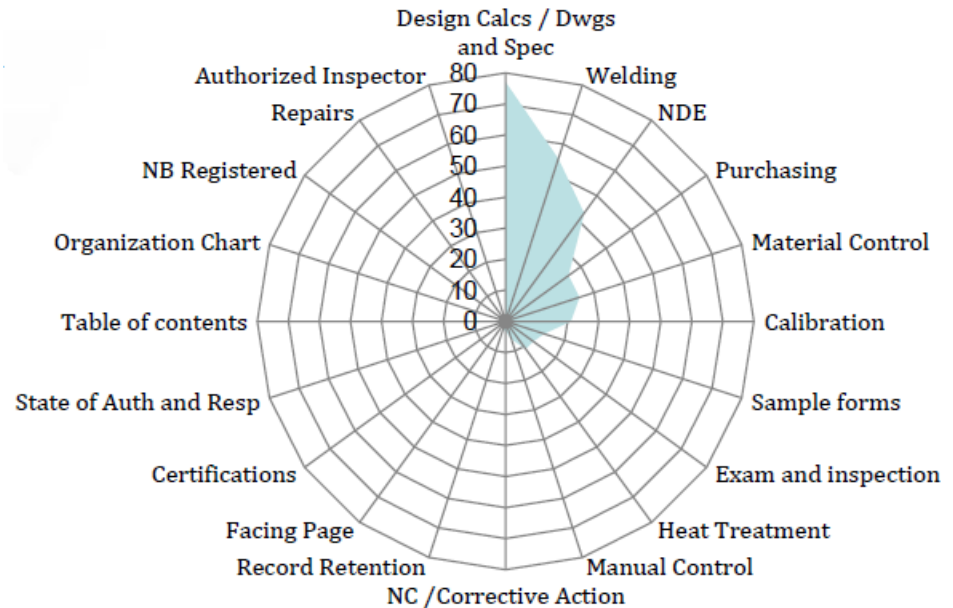


Reality – Deficiencies Happen

Distribution of Findings from CH Audits

- What do you expect would happen with a Mfr. that does not hold an ASME Certificate and is not serviced by an AIA?*

Findings Distribution (%)



Reasons why companies don't stamp

- The Code's inspection requirements add unnecessary cost.

Response: Third party inspection of critical pressure equipment is unavoidable. Ongoing Inspection improves the value of the product produced and reduces your risk. Critical to countering costs of employee turnover & revisions to the Code.

- It's difficult to find local certified manufacturers.

Response: Over 7,350 accredited and authorized manufacturers listed on ASME.org website. 54% outside of the U.S. and growing!

Reasons why companies don't stamp

- Materials required by the ASME Code aren't available locally.

***Response:** The code allows certified manufacturers to re-certify material to an ASME Code specification, provided that the minimum chemical and mechanical properties are met.*

However, materials specified in the Code have been proven in service. Substitution of inferior materials have serious implications on joining, FFS and useful life of pressure equipment assets.

Reasons why companies don't stamp

- “There's no real difference between equipment that is stamped and equipment that isn't.”


Response:

- *Ongoing 3rd Party verification assures consistency in manufacturing and control of processes*
- *Verified design of welded joints and qualification of welding procedures and personnel (weld quality often sacrificed when stamping is waived)*
- *Records retained for a stamped product are indispensable for future asset repair, alteration or sale*
- *Assurance that your vessel fully complies with ASME Code*

You will ultimately get what you pay for!

- If you're being promised equipment that's the same as "certified," but at significant savings, you need to take a closer look at what you are purchasing
- Understanding the methods manufacturers use to cut costs is critical to understanding the importance of stamping
- Knowing these methods enable an end user to determine in advance which substitutions/sacrifices are acceptable.

To Stamp or Not to Stamp, That is the Question?

 U2 W (if arc or gas welded) RT (if radiographed) HT (if postweld heat treated)	Certified by _____ Name of Manufacturer
	Pressure ____ at temperature ____ Max allowable working pressure
	Pressure ____ at temperature ____ Max allowable external working pressure [if specified; see Note (1)]
	Temperature ____ at pressure ____ Min. design metal temperature
	Manufacturer's serial number _____
	Year built _____

For End Users the best overall value for the life of your purchased pressure retaining item is to purchase items bearing the ASME Certification Mark.

Demand the Mark!

Section VIII, Division 2 Class 1 Construction



Section VIII, Division 2

Addition of Class 1 Construction

- Section VIII, Division 2 intended for construction of custom engineered pressure vessels
- Primarily servicing the Petrochemical Industry
- In 2017 Edition, second class of construction [Class 1] added to Section VIII, Division 2
- Construction to the current VIII-2 requirements will be called Class 2
- Many VIII-1 Certificate Holders will likely acquire VIII-2 Stamps as a result of this change



Section VIII, Division 2

Addition of Class 1 Construction

- Class 1 reduces certain VIII-2 requirements such that it will become a more competitive option to VIII-1
- Key difference is elimination of certification of UDS and MDR by a Registered Professional Engineer for vessels exempt from fatigue evaluation
- Let's look at a comparison between Class 1 and Class 2



Section VIII, Division 2

Class 1 versus Class 2

FEATURE	CLASS 1	CLASS 2
Margin on UTS Allowable Stresses	3.0	2.4
Materials	Same as Class 2 except 25 materials not permitted	No change to list of available materials
Design Requirements	Same as Class 2, except not permitted to use Part 5 to overrule Part 4	Part 4 or Part 5
Toughness Requirements	Use same impact test exemption curves; Adjustment to low stress reduction curves to reflect difference in margin on UTS	
Certification of UDS per Annex 2A	Only required when fatigue analysis must be performed	Always required
Certification of MDR per Annex 2B	Only required when fatigue analysis must be performed, and when Part 5 is used because Part 4 does not contain rules	Always required
Fabrication	No difference from Class 2	

Section VIII, Division 2

Class 1 versus Class 2

FEATURE	CLASS 1	CLASS 2
NDE VIII-2 Table 7.2	No difference from Class 2	
Pressure Tests – Part 8	No difference from Class 2	
Overpressure Protection	No difference from Class 2	

Summary - Design Differences Between VIII-1, Case 2695, VIII-2 Class 1 and 2

- Scope of VIII-1 very broad
- Mass produced vessels such as air receivers, propane tanks
- Process vessels such as tanks, H/X, towers, reactor vessels, unfired steam boilers
- Vessels constructed to special materials, such as graphite, cast iron, materials for ultra low temperature
- VIII-1 is a simple code using design-by-rule only and large design margin on UTS
- VIII-2 intended to service the petrochemical industry
- Two classes of construction with higher design margins on UTS (3.0 and 2.4)
- Design-by-Rule and Design-by-Analysis options
- Requirements for material selection, fabrication, NDE, inspection & testing all focused on the needs of petrochemical industry
- Pressure equipment constructed to VIII-2 will be most efficient in terms of weight for a given P/T and fabrication cost

The background features a stylized illustration of a hand holding a pen, drawing a globe. The globe is outlined in white and contains faint outlines of continents. Surrounding the globe are various architectural landmarks, including the Eiffel Tower, the Colosseum, and other classical structures, all drawn in white lines. The overall theme is global engineering and architecture.

Thank You
Questions?

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