

PRESSURE POINTS

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Code Services

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ASME CODE NEWS

The ASME Boiler and Pressure Vessel Code Continues to Evolve

By Jay Cameron, P.E., Senior Consulting Engineer
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The ASME Code is under constant review by the Committees responsible for them, with balanced input from all interest groups. The Code is revised by Addenda on an annual basis, and has Interpretations and Cases published on a quarterly basis. This allows the Code to keep up with changing technology and to incorporate any lessons-learned from negative field experience.

The following are a brief summary of some of the changes that were incorporated in the 2005 Addenda that was released on July 1, 2005 and became mandatory on January 1, 2006, and also some "previews of coming attractions" from Committee actions for the 2006 Addenda to be published on July 1, 2006.

2005 Addenda

Section I, Power Boilers

- **PW-39.2** - added mandatory post-weld heat treatment (PWHT) for welds with filler metal with specified Chromium > 3%.
- **Table PW-39** for P-No. 5B, Group No. 2 (Grade 91, T91, P91) - PWHT requirements revised.

Section VIII, Division 1, Pressure Vessels

- New paragraphs **UG-6(b)** and **UG-14(b)** - explicitly prohibit the use of rod and bar for certain applications, and allow its use for small diameter hollow parts.
- Revised **UG-11(a)(1)**, **Footnote 6** - clarify the definition of standard pressure parts produced to a manufacturer's standard. The Manufacturer of the completed vessel must be assured that all such parts comply with all the applicable rules in the Code, and are suitable for the design conditions of the vessel.

2006 Addenda

ASME B16.5-2003, Flanges

- **Section I, Table A-360; Section VIII, Division 1, Table U-3; and Section VIII, Division 2, Table AG-150.1** were updated to adopt *ASME B16.5-2003* for flanges.

It has been reported that the pressure-temperature ratings for some B16.5 flanges have been reduced by the adoption of this version of B16.5



Section I, Power Boilers

- **PG-27 & Appendix A-317: Alternative Equation for Calculating Cylinder Thickness** - unifies current equations into a single new equation that allows a reduced thickness for high pressure application.

Section VIII, Division 1

- **UG-19(a), UG-21, UG-116(j)(1), UG-120(b), UHX-12.4(b), UHX-13.4(a), UHX-14.4(b) & UHX-19, App W (Table W-3, Note 53): Heat Exchanger Design Pressures and Temperatures** - requirements clarified.

Section VII, Divisions 1 & 2

- **Tables UCS-56 & AF-402.1** for P-No. 5B, Group No. 2 (Grade 91, T91, P91) - PWHT requirements revised.

Code Case Expiration Dates and Annulments



The ASME Boiler and Pressure Vessel Standards Committee took action to eliminate Code Case expiration dates, effective March 11, 2005. This means that all Code Cases listed in Supplement 3 and beyond will remain available for use until annulled by the ASME Boiler and Pressure Vessel Standard Committee.

Go to www.hsbglobalstandards.com to see a list of annulled non-nuclear Code Cases for the 2004 Edition.

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ASME MATERIALS TASK GROUP INAUGURATED TO ADDRESS CERTAIN PED GUIDELINES

By Alex Garbolevsky, P.E., Senior Code Consultant
Codes and Standards Group

ASME has formed a Materials Task Group in response to European Pressure Equipment Directive (PED) Guidelines, such as Guideline 7/24 concerning the use of ASME materials for vessels to be “CE” marked. The task group held their first meeting during the August 2005 Boiler & Pressure Vessel Code Week in Los Angeles, CA.

PED Guideline 7/24

PED Guideline 7/24 indicates that the values used in calculations for materials to establish minimum thickness of pressure equipment must be those assured by the material manufacturer.

PED Guideline 7/24 was first accepted by Working Group “Pressure” in November 2003, and the Notified Body Forum in Europe has taken the position that the use of ASME material *does* meet the intent of this guideline. *However the ASME Materials Task Group has been cautioned that this position does not have full support of the European Commission.*

The issue with Guideline 7/24 is that ASME material specifications do not guarantee properties at elevated temperatures. When using the ASME Codes for operating temperatures up to 50°C (122°F) the room temperature information assured by ASTM/ASME specifications are sufficient. Where the operating temperatures are greater than this level PED Guideline 7/24 becomes an issue. The values used in calculations for the ASME Code are determined by the Code committee and are based on temperature-dependent trend curves from data from at least three heats of material (and some significantly more) and experience, and are considered to be values suitable for use in the Code calculations, but are not guaranteed minimum values.

However, as stated before, the Notified Body Forum in Europe has taken the position that the use of ASME material *does* meet the intent of this guideline.

Future Considerations

ASME was strongly advised to find a solution in preparation for the probable eventuality of a stricter implementation of Guideline 7/24.

A non-mandatory appendix is being contemplated to propose that certifying materials to ASME SA/SB specifications is the material manufacturer’s confirmation that the values established by the Code committee on the basis of trend curves and other

relevant information are appropriate for use in ASME Code calculations.

The ASME Materials Task Group has also proposed to make changes to some of the ASME Fabrication Codes to provide details of requirements to meet PED in the form of non mandatory appendices. Another consideration at this very early stage are changes to specific material specifications, if necessary.

After significant discussion, the task group decided that one immediate course of action to solve this problem is to adopt additional EN material specifications for use for ASME construction. *A code case will be prepared which will permit vessel designers to derive the allowable stresses to be used in construction directly from the EN material specification, thereby satisfying the requirement that the design values are appropriate for the vessel being constructed.* Work will proceed over the coming months to develop this code case and obtain its approval.

More information on the PED Guidelines are available through the ASME Interpretations Database feature on www.hsbglobalstandards.com.



IMPORTANT MATERIAL CONSIDERATIONS FOR THE PED

By Mark H. Masters, P.E., Manager
Technical Resource Support (TRS)

Formal adoption by the European Community (EC) of the Pressure Equipment Directive (PED) has done much to open the European pressure equipment market to fabricators of pressure equipment. Prior to the PED, each of the countries comprising the EC had unique requirements for pressure equipment installed in its jurisdiction. Obviously, this created an environment that was cumbersome for pressure equipment fabricators. For example, an identical heat exchanger intended for export to Germany, France, England, etc., would have to

meet the pressure equipment regulations for each country, with the regulations differing sometimes substantially for each. With the inception of the PED, one set of standards now applies, increasing predictability of the certification process for manufacturers of pressure equipment, and facilitating a uniform approach to compliance.

The ASME Boiler and Pressure Vessel Code can be used as the basis for PED compliance, albeit with some extra provisions required to demonstrate that the Essential Safety Requirements of the PED have been met. The most notable requirements are related to sourcing material, and qualifying personnel and procedures for both permanent joining (welding and/or brazing) and non-destructive examination. The balance of this article is focused on material requirements.

Material Requirements

When using ASME-specified materials (as described in Section II of the ASME Code), pressure equipment manufacturers must prepare a Particular Material Appraisal (PMA) to explicitly document material properties and the potential failure modes, effects, and mitigation for these materials in the context of the operating/design conditions of the pressure equipment for which the materials are proposed. The manufacturer must certify that the information presented in the PMA is accurate and appropriately engineered. Further, for pressure equipment falling under Hazard Categories III and/or IV, the PMA must be reviewed and certified by a Notified Body duly authorized by a Member State of the EC (HSB International holds this authorization as a Notified Body accredited in Germany by ZLS). Examples of the failure modes that must be explicitly documented include: toughness, ductility, aging, and suitability for processing (i.e., welding procedures, heat treatment, etc.).

Properties of materials used in the fabrication of pressure equipment intended for export to the EC must also be certified by the manufacturer of the material (forge, foundry, mill, etc.) and, unless additional material testing is performed and witnessed by a duly-authorized Notified Body which certifies that the material meets the PED requirements, the material manufacturer must also be “approved” to supply PED pressure equipment material. Guideline 7/2 of the PED was recently revised to clarify the material manufacturer approval requirements. Material certification by the Notified Body is the most costly approach to material certification to the PED requirements.

There are two approaches for material manufacturer approval:

1 The material manufacturer’s quality management system is certified as meeting the requirements of ISO 9000. The ISO 9000 system must also be certified by an ISO registrar that is a legal entity in the EC (many ISO

registrars headquartered outside of the EC do *not* meet this requirement and pressure equipment manufacturers are cautioned to carefully review the ISO 9000 certificates of potential material manufacturers *prior to* sourcing material). Note: HSB Registration Services (HSB RS) auditors have been duly qualified by HSB International and can audit the elements of ISO 9001:2000 and the PED simultaneously, giving HSB RS the flexibility of providing material manufacturers with PED approval. For more information, contact Janet Kowalski at 800-417-3421, ext. 1419.

2 The material manufacturer must be approved by a duly authorized Notified Body (HSB International holds this authorization). Approval is documented on a certificate issued to the material manufacturer by the Notified Body.

If the material manufacturer is not able to meet either of the two requirements above, material properties must be verified through chemical/mechanical tests which must be witnessed by a representative of the Notified Body. Documentation requirements for the material inspection approach are set forth in the EN 10204:2004 standard (available for purchase online from a number of different sources).

It is important to note that there are some materials, in particular, which are not acceptable for use in the fabrication of pressure equipment for EC export (SA-36 is one example of note). Further the use of welded material (such as electric-resistance welded pipe like SA-53 ERW), requires that the manufacturer have PED-approved welding personnel and procedures.

HSB CT has prepared a list of material manufacturers that were known to have met the material manufacturer approval requirements of the PED at the time HSB CT reviewed their ISO certificate and/or material manufacturer approval certificate. (Note: it is the manufacturer’s responsibility to ensure that the material manufacturer approval remains current.) HSB CT can also help you select PED-compliant materials and assist in preparing the documentation required to demonstrate compliance.

Contact your local HSB CT Code Services Specialist or TRS Account Manager for a copy of the list of approved material manufacturers, or for answers to specific questions related to the PED.

Midwestern/Southwestern U.S. and Latin America	Eastern/Western U.S.
Mr. Eugene Iacino Code Services Specialist (330) 221-7713	Mr. David Allore Code Services Specialist (704) 490-0238
Ms. Robin Fisher TRS Account Manager (860) 722-5434	Ms. Delinda Whiting TRS Account Manager (610) 286-0216

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■ **Technical Resource Support** provides independent and objective analyses of equipment, processes, and systems to local and international codes and standards including the European Pressure Equipment Directive (PED) through the following services: vendor surveillance, third party inspection, expediting, auditing, project management, and consulting. Contact Joann Onimus, 800-417-3421 x 1504, e-mail: joann_onimus@hsbct.com.

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For more information on our services, call 800-417-3437, ext. 5542.

■ **ASME Codes and Standards Group** offers technical consulting and design review services to both manufacturers and users of boilers and pressure vessels. Contact Tom Pastor, 860-722-5615, or via e-mail at thomas_pastor@hsbct.com.

■ **HSB Registration Services** provides document reviews, pre-audits, certification audits, and registration to ISO 9001:2000 and ISO 13485 (medical devices focus) quality system management standards, AS9100 requirements (aerospace focus), ISO 14000 environmental management systems standards (through a partnership with HSB Korea), and PED material manufacturer approvals (through a partnership with HSB International, GmbH). Contact Janet Kowalski, 484-582-1419, e-mail: janet_kowalski@hsbct.com, or visit www.hsbiso.com.

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