

# ASME Code Cases: What are they and how do I get one?

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Presented at Valve Manufacturers Association of America's  
2016 Technical Seminar & Exhibits  
March 9-11, 2016 New Orleans, LA

A.K.A.

**The ASME Code Process for a  
Code Case:  
Non-traditional Manufacturing  
Methods/Materials**

# Scope of Presentation

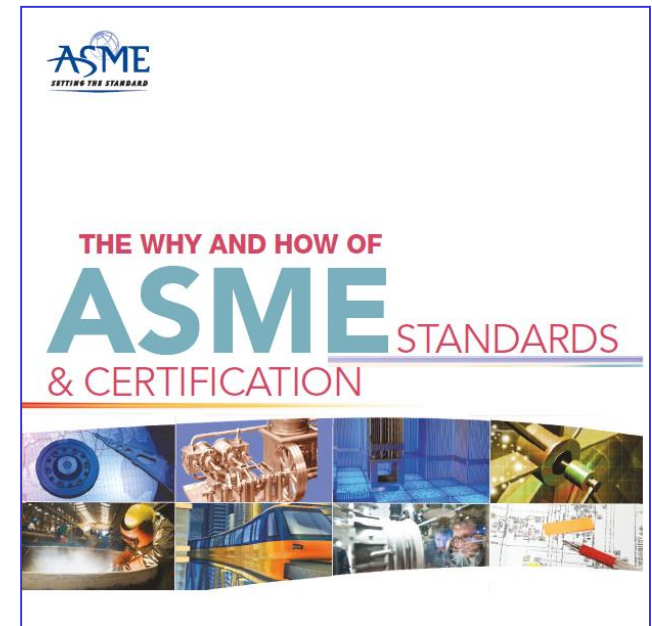
- What is a Code Case?
- History of Code Cases
- Process for developing a Code Case
- Current Code Cases for non-traditional materials manufacturing methods
- In-process Code Cases for the same
- Code Case use
- Open Q&A on ASME materials

# Background

- HSB Global Standards
  - Third-party inspection company for pressure equipment
    - ASME B&PV
    - Other International: PED, Malaysia, Singapore, Australia, etc.
    - TPI
  - [getinfo@hsbct.com](mailto:getinfo@hsbct.com)
- Jay Cameron
  - BSME, MSMet
  - aerospace, oilfield, pressure equipment
  - ASME Committees
  - ASM, ASTM, NACE

# *What* is a Code Case?

- What is a standard?
  - Set of technical definitions and guidelines
- What is a Code?
  - A standard adopted by a government
    - has the force of law
  - or a standard required by contract





# *What* is a Code Case?

- What is a Code?



# *What* is a Code Case?

- Code Case:
  - Exception or alternative to Code rules **[WHY]**
  - Non-mandatory
  - Available to all **[WHO]**
  - Very specific requirements
  - Vast majority are new materials
  - Usually at least documented on ASME Manufacturer's Data Report

# *What* is a Code Case?

- Advanced metal alloys: laboratory → industry
- Non-metallic materials
- Advanced materials manufacturing methods:
  - HIP'd powder metal parts
  - Sintered ceramic parts
  - “additive manufacturing” processes



# What is a Code Case? (cont.)

- From page xxvi of the ASME B&PVC:

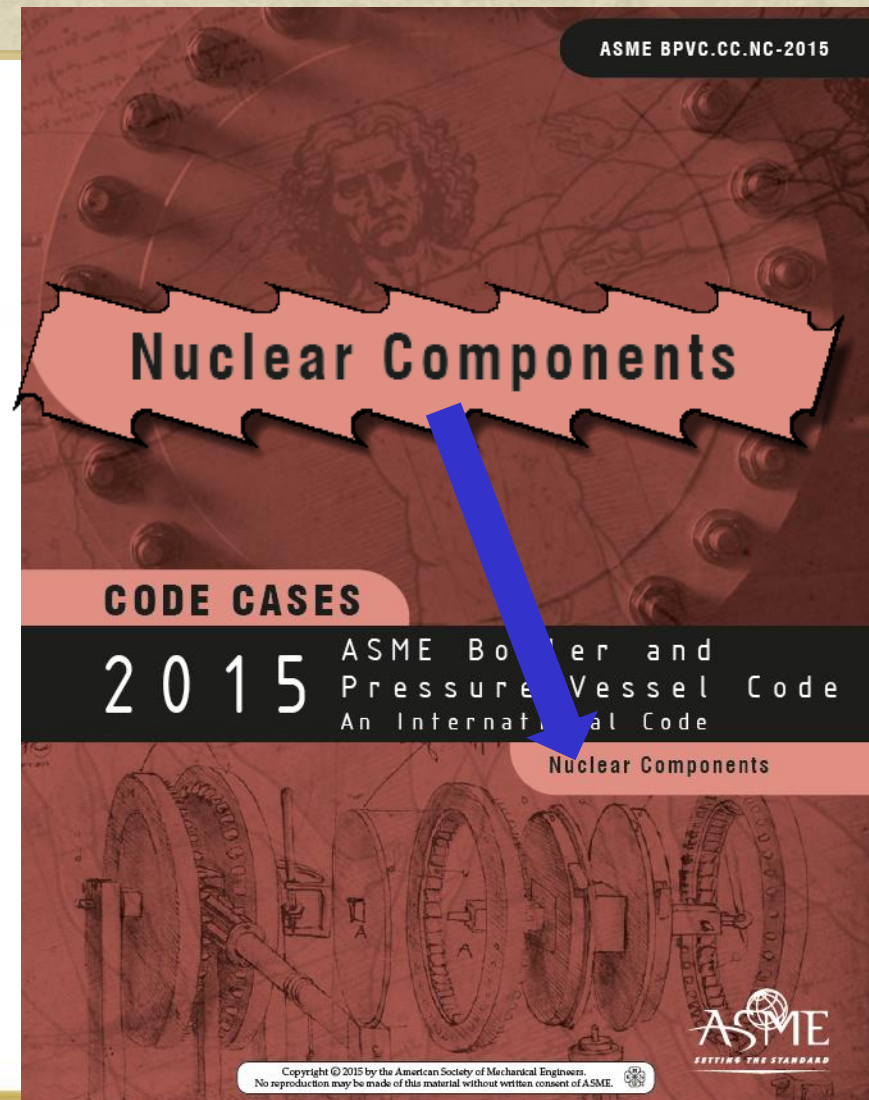
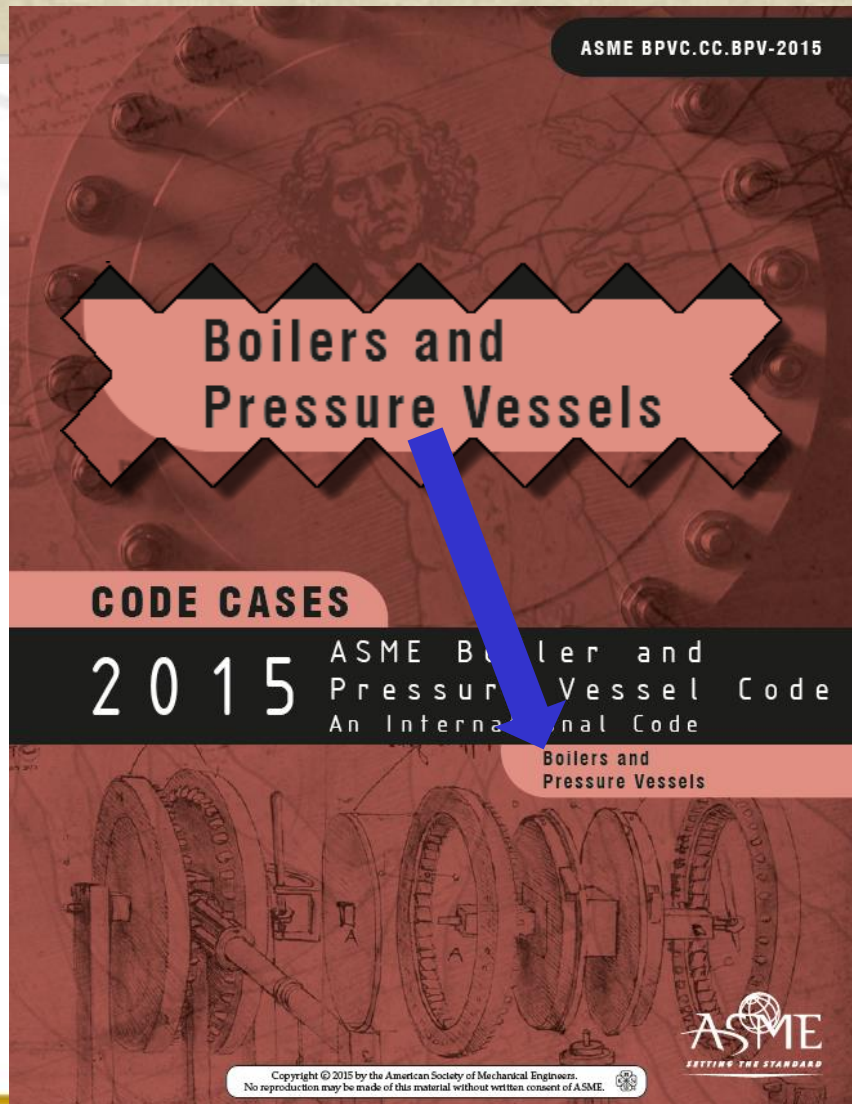
## CODE CASES

The Boiler and Pressure Vessel Code committees meet regularly to consider proposed additions and revisions to the Code and to formulate Cases to clarify the intent of existing requirements or **provide, when the need is urgent, rules for materials or constructions not covered by existing Code rules.** Those Cases that have been adopted will appear in the appropriate 2015 Code Cases book: “Boilers and Pressure Vessels” or “Nuclear Components.” Supplements will be sent or made available automatically to the purchasers of the Code Cases books up to the publication of the 2017 Code.

# What is a Code Case? (cont.)

- Published for ASME B&PVC
  - I, II, III, IV, V, VIII-1/2/3, IX, X, XI & XII
- Also published for Piping Codes
  - e.g., B31.1, B31.3, B31.12
- And for other ASME standards
  - e.g., B16.34

# What is a Code Case? (cont.)



# Example Code Cases

## CASES OF ASME BOILER AND PRESSURE VESSEL CODE

CASE  
2192-8

ASME BPVC.CC.BPV-2015

CASE  
2179-8

Approval Date: December 18, 2012

Approval Date: June 28, 2012

Code Cases will remain available for use until annulled by the applicable Standards Committee.

### Case 2192-8 Modified 9Cr-1Mo-V Cast Material Section I

*Inquiry:* May modified 9Cr-1Mo-V castings with the chemical analysis shown in Table 1, the mechanical properties shown in Table 2, and otherwise conforming to applicable requirements in the following specifications, be used for Section I construction?

(a) Castings, SA-217

(b) Centrally Cast Pipe, SA-217

placed on selected castings in each head  
The number and location of thermocou

## CASES OF ASME BOILER AND PRESSURE VESSEL CODE

CASE  
2397

## CASES OF ASME BOILER AND PRESSURE VESSEL CODE

CASE  
2787

Approval Date: November 1, 2013

Code Cases will remain available for use until annulled by the applicable Standards Committee.

## CASES OF ASME BOILER

Approval Date:

The ASME Boiler and Pressure Vessel Code eliminates Code Case expiration dates for all Code Cases listed in this Supplement until annulled by the ASME Boiler and Pressure Vessel Code Committee.

### Case 2787 Multiple Marking of Certified Capacities for Pressure-Relief Valves Section VIII, Division 1

*Inquiry:* Under what conditions may a Manufacturer or Assembler of a pressure-relief valve place more than one certified capacity on the pressure-relief valve or the nameplate?

*Reply:* It is the opinion of the Code Committee that the requirements for a lifting device UG-136(a)(3) may be omitted, provided the user has a documented procedure for the implementation program for the pressure-relief valve.

(a) The user has a documented procedure for the implementation program for the pressure-relief valve.

(2) There shall be no adjustments to any of the pressure-relief valves after completion of the testing on the first media.

(3) The measured set pressure for the valve tested on the additional medias shall meet the tolerance requirements of UG-134(d)(1), based on the pressure at which the valve was set to operate in (a)(1), or marked set pressure for sample production valves.

## Weld Detail

CASE  
2751

Spherical head

Taper 3:1 min.

Tangent line

$t_{shell}$

Cylindrical shell with integral backing ring

### Case 2203-1 Omission of Lifting Device Requirements for Pressure Relief Valves on Air, Water Over 140°F, or Steam Service Section VIII, Division 1

### Case 2751 Alternative Rules for Hemispherical Cylindrical Shell Having In Part of the Shell Section VIII, Division 1

*Inquiry:* Under what conditions may a hemispherical head be attached to a cylindrical shell?

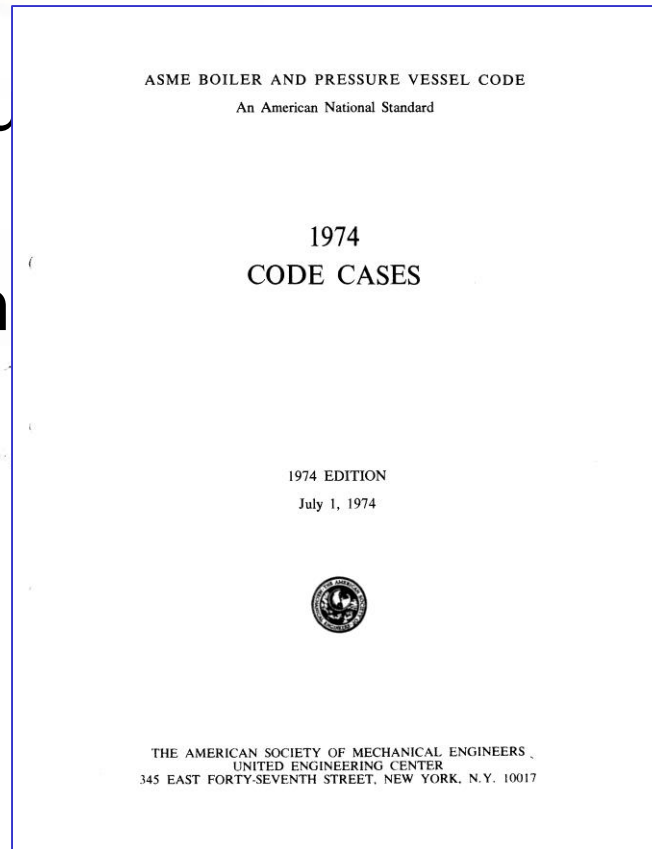
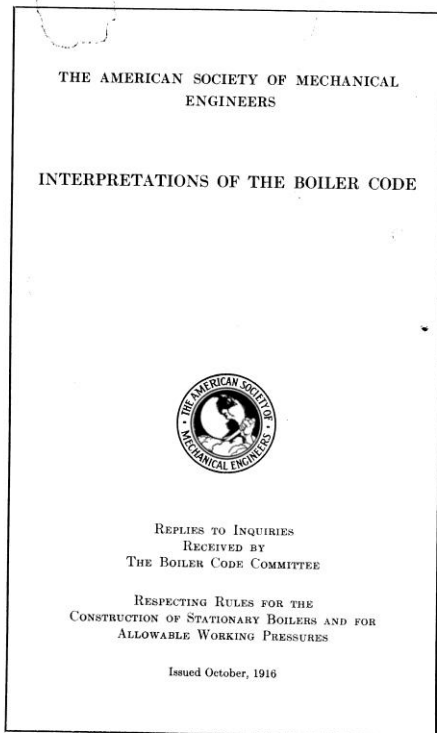
design requirements (UW-2). The integral backing ring shall be based on full thickness requirements in Table UW-2.

Standards



# History of Code Cases

- Originally published by the American Society of Mechanical Engineers — also called ASME
- First published in 1916



Stationary  
field

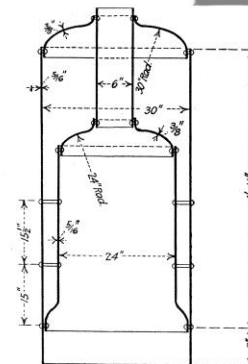
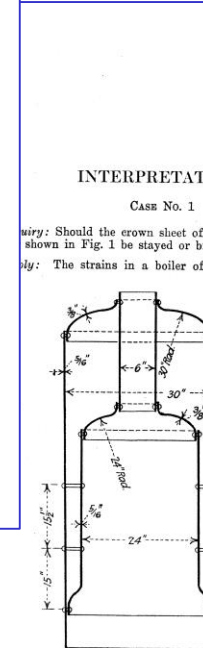


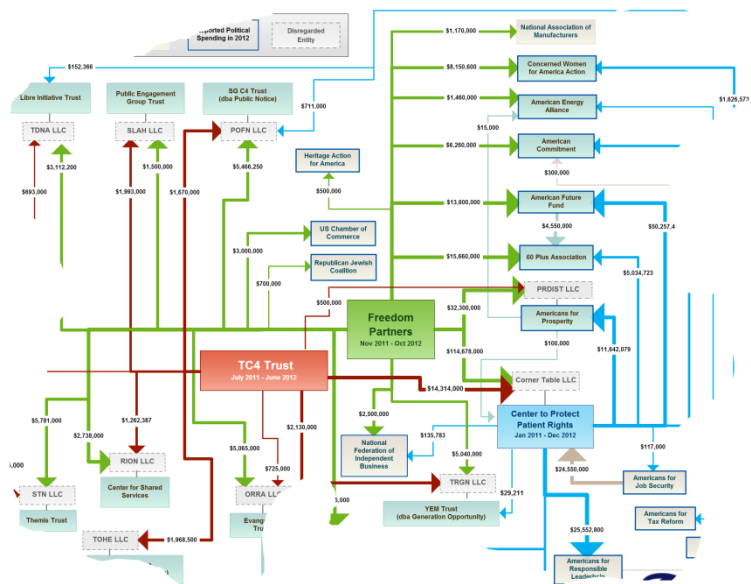
FIG. 1 A DESIGN OF VERTICAL SINGLE FLUE BOILER

calculated, and it is the expressed desire of the Committee that such a boiler of the particular size and make be tested to destruction in the presence of the Ohio state inspector and the inspector of an authorized insurance company doing business in the State of Ohio.



# Process for developing a Code Case

- Can take as little as 2 months (highly unlikely) to years – most typical is about a year
- ASME Committee process flowchart:



# Process (cont.)

- Difficulty:
  - Can proceed on auto-pilot, rather easy
  - Can be quite involved
    - technically, administratively and politically
- Actual work
  - Done offline with electronic balloting
  - During in-person quarterly meetings called Code Weeks
- Committees
  - Some meet concurrently
  - May need to literally run from one meeting to another
  - Interested party / Consultant / Project Manager

# Process (cont.)

- “Try before you buy”
  - New materials
  - New design rules
  - New welding technologies
  - New NDE technologies
  - Etc.
- Timing
  - Issued quarterly
  - Code book revision: 2-year schedule
  - Code Case revisions can be done quarterly
- Longevity:
  - Intended to be temporary
  - Processed for incorporation or annulment
  - More Code Cases are added than are incorporated
    - Currently >400 B&PVC & >250 Nuclear CCs

# *How* do I get a new one?

- From the Foreword:

The Committee meets regularly to consider revisions of the rules, new rules as dictated by technological development, **Code Cases**, and requests for interpretations. Only the Committee has the authority to provide official interpretations of this Code. Requests for revisions, new rules, **Code Cases**, or interpretations shall be addressed to the Secretary in writing and shall give full particulars in order to receive consideration and action (see Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees). Proposed revisions to the Code resulting from inquiries will be presented to the Committee for appropriate action. The action of the Committee becomes effective only after confirmation by ballot of the Committee and approval by ASME. Proposed revisions to the Code approved by the Committee are submitted to the American National Standards Institute (ANSI) and published at <http://go.asme.org/BPVCPublicReview> to invite comments from all interested persons. After public review and final approval by ASME, revisions are published at regular intervals in Editions of the Code.



# *How* do I get a new one? (cont.)

- From page xxx of the ASME B&PVC:

## **SUBMITTAL OF TECHNICAL INQUIRIES TO THE BOILER AND PRESSURE VESSEL STANDARDS COMMITTEES**

### **1 INTRODUCTION**

(a) The following information provides guidance to Code users for submitting technical inquiries to the committees. See Guideline on the Approval of New Materials Under the ASME Boiler and Pressure Vessel Code in **Section II, Parts C and D** for additional requirements for requests involving adding new materials to the Code. Technical inquiries include requests for revisions or additions to the Code rules, requests for **Code Cases**, and requests for Code Interpretations, as described below.

(2) **Code Cases**. Code Cases represent alternatives or additions to existing Code rules. Code Cases are written as a question and reply, and are usually intended to be incorporated into the Code at a later date. When used, Code Cases prescribe mandatory requirements in the same sense as the text of the Code. However, users are cautioned that not all jurisdictions or owners automatically accept Code Cases. The most common applications for Code Cases are:

- (-a) to permit **early implementation of an approved Code revision** based on an urgent need
- (-b) to permit the use of a **new material** for Code construction
- (-c) to gain experience with new materials or **alternative rules** prior to incorporation directly into the Code



# ***How*** do I get a new one? (cont.)

- From page xxx of the ASME B&PVC:

## **2 INQUIRY FORMAT**

Submittals to a committee shall include:

*(a) Purpose.* Specify one of the following:

- (1)* revision of present Code rules
- (2)* new or additional Code rules
- (3)* Code Case
- (4)* Code Interpretation

*(b) Background.* Provide the information needed for the committee's understanding of the inquiry, being sure to include reference to the applicable Code Section, Division, edition, addenda (if applicable), paragraphs, figures, and tables. Preferably, provide a copy of the specific referenced portions of the Code.

*(c) Presentations.* The inquirer may desire or be asked to attend a meeting of the committee to make a formal presentation or to answer questions from the committee members with regard to the inquiry. Attendance at a committee meeting shall be at the expense of the inquirer. The inquirer's attendance or lack of attendance at a meeting shall not be a basis for acceptance or rejection of the inquiry by the committee.

# ***How*** do I get a new one? (cont.)

- From page xxxi of the ASME B&PVC:

## **4 CODE CASES**

Requests for Code Cases shall provide a Statement of Need and Background Information similar to that defined in 3(b) and 3(c), respectively, for Code revisions or additions. The urgency of the Code Case (e.g., project underway or imminent, new procedure, etc.) must be defined and it must be confirmed that the request is in connection with equipment that will bear the Certification Mark, with the exception of Section XI applications. The proposed Code Case should identify the Code Section and Division, and be written as a *Question* and a *Reply* in the same format as existing Code Cases. Requests for Code Cases should also indicate the applicable Code editions and addenda (if applicable) to which the proposed Code Case applies.

# How do I get a new one? (cont.)

- From Section II, Part D, Appendix 5:

## **MANDATORY APPENDIX 5 GUIDELINES ON THE APPROVAL OF NEW MATERIALS UNDER THE ASME BOILER AND PRESSURE VESSEL CODE**

### **5-100 CODE POLICY**

It is expected that requests for Code approval will normally be for materials for which there is a recognized national or international specification. It is the policy of the ASME Boiler and Pressure Vessel (BPV) Committee on Materials to approve, for inclusion in the Code Sections, only materials covered by specifications that have been issued by standards-developing organizations such as, but not limited to, American Petroleum Institute (API), American Society for Testing and Materials (ASTM), American Welding Society (AWS), Canadian Standards Association (CSA), European Committee for Standardization (CEN), Japan Industrial Standards (JIS), Standards Association of Australia (SAA), and China Standardization Committee (CSC).

Material specifications of other than national or international organizations, such as those of material producers/suppliers or equipment manufacturers, will not be considered for approval. The Committee will consider only official requests for specifications authorized by the originating standardization body and available in the English language and in U.S. Customary and/or SI/Metric units.

***[WHO]***

# Current Code Cases for non-traditional materials manufacturing methods

- Polymer: Sections III, IV, VIII-1

<p><b>Approval Date: January 21, 1982</b></p> <p><i>Code Cases will remain available for use until annulled by the appli</i></p>	
<p><b>Case N-755-2</b>  <b>Use of Polyethylene (PE) Class 3 Plastic Pipe</b>  <b>Section III, Division 1</b></p>	<p><b>Approval Date: August 13, 2013</b></p> <p><i>Code Cases will remain available for use until annulled by the appl</i></p> <p>(2) three  (made from  (3) poly</p>
<p><b>Case 2411</b>  <b>Use of Poly</b>  <b>Section IV</b></p>	<p><b>Approval Date: September 15, 2015</b></p> <p><i>Code Cases will remain available for use until annulled by the applica</i></p> <p>(i) The n</p>
<p><b>Case 2795</b>  <b>Use of PTFE Tubing Material for Flue</b>  <b>Exchanger Tubes</b>  <b>Section VIII, Division 1</b></p>	<p><b>Case 2837</b>  <b>Use of PFA Tubing Material for Flue Gas Heat Exchanger</b>  <b>Tubes</b>  <b>Section VIII, Division 1</b></p> <p>(-a) nar  tubes were ma  (-b) lot  run is the leng</p>



# Current Code Cases for non-traditional materials manufacturing methods

- Powder metal: Section I/B31.1 & Section III
  - Gr 91 (CC 2770): described by EPRI @ VMA 2014
  - 316L (CC N-834): ditto

**Approval Date: August 7, 2003**

*Code Cases will remain available for use until annulled by the app*

Case  
Bo  
for  
Sec

*Code Cas*

**B31 Case 198**

**Approval Date: January 21, 2015**

**Grade 91 Steel-- 9%Cr-1%Mo (K90901)  
ASME B31.1**

*Inquiry:* May normalized and tempered UNS K90901 material that meets the specification requirements of ASTM A989 / A989M-13 for hot isostatically-pressed alloy steel powder metallurgy parts for high temperature service be used for ASME B31.1 components for wellhead construction?

**Case 2770**

**Grade 91 Steel, 9%Cr-1%Mo  
Section I**

*Inquiry:* May austenitized and tempered material that meets the specification requirements of ASTM A989/A989M-11 for hot isostatically-pressed alloy steel powder metallurgy parts be used for ASME B31.1 components for wellhead construction?

**Case N-834**

**ASTM A988/A988M-11 UNS S31603, Subsection NB,  
Class 1 Components  
Section III, Division 1**

*(1) Dens*

*amination shall be performed on specimens removed from the welds in accordance with ASTM A988/*

*ards*



# In-process Code Cases for the same

- Powder metal
  - Section I:
    - ASTM A988-13 S30400/03, S31600/03, S31725, S31254, N08367
    - ASTM A989-13 K90941 (9), K31545 (21), K21590 (22)
    - ASTM B834-13 N06600, N08367, N06625, N06690, N07718
  - B16.5/34/47:
    - ASTM A989-xx K90901 (91)
  - VIII-3:
    - ASTM Axxx “SA-723” HSLA

# In-process Code Cases (cont.)

- Ceramic
  - Section VIII-1: sintered SiC
- Polymer
  - VIII-1: cast acrylic



# In-process Code Cases (cont.)

- Additive manufacturing

The screenshot shows the ASME Codes & Standards website. The header includes the ASME logo and a "GO TO ASME" link. The main navigation bar features links for LOGIN, PUBLICATIONS, C&S CONNECT, COMMITTEE CENTRAL, MEETINGS, and STAFF. A prominent green banner highlights the "BPTCS PROJECT TEAM ON EVALUATION OF ADDITIVE MANUFACTURING FOR PRESSURE RETAINING EQUIPMENT". Below the navigation bar, a red text alert states "C&S Connect has been updated. Click here to find out more." The left sidebar contains a "HOME" link and a "Meetings This Committee" section with a note to "Please LOGIN to Reveal Members-Only Features". The main content area is titled "Charter" and includes a table of "Officers" and a "Staff Contact" section.

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Charter

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# Code Case use

- Section VIII, Division 1

## **MANDATORY APPENDIX 43 ESTABLISHING GOVERNING CODE EDITIONS AND CASES FOR PRESSURE VESSELS AND PARTS**

### **43-1 GENERAL**

*(a)* After Code revisions are approved by ASME, they may be used beginning with the date of issuance shown on the Code. Except as noted in *(b)* below, revisions become mandatory 6 months after the date of issuance. **Code Cases** are permissible and may be used beginning with the date of approval by ASME. Only Code Cases that are specifically identified as being applicable to this Section may be used. At the time a Code Case is applied, only the latest revision may be used. Code Cases that have been incorporated into this Section or have been annulled shall not be used.

*(b)* Changes in the Code and **Code Cases** that have been published prior to completion of the pressure vessel or part may include details critical to the intended service conditions of the pressure vessel and therefore should be considered by the Manufacturer. Application of such changes shall be a matter of agreement between the Manufacturer and the user. Specific incorporated Code provisions from later editions that have been applied to construction shall be noted in the "Remarks" section of the Manufacturer's Data Report.



# Code Case use (cont.)

- Usually at least documented on ASME Manufacturer's Data Report

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS			
As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1			
1. Manufactured and certified by _____ (Name and address of Manufacturer) ①			
2. Manufactured for _____ (Name and address of Purchaser) ②			
3. Location of installation _____ (Name and address) ③			
4. Type _____ (Horizontal, vertical, or sphere) ④ (Tank, separator, jkt. vessel, heat exch., etc.) ⑤ (Manufacturer's serial number) ⑧			
_____ ⑨ (CRN)	_____ ⑩ (Drawing number)	_____ ⑫ (National Board number)	_____ ⑬ (Year built)
5. ASME Code, Section VIII, Div. 1 _____ [Edition and Addenda, if applicable (date)] ⑭ (Code Case number) ⑮ [Special service per UG-120(d)]			



# Code Case use (cont.)

- Purchaser acceptance
- Jurisdictional acceptance



A screenshot of the National Board of Boiler and Pressure Vessel Inspectors website. The header includes the logo and navigation links: Home, Create Account, and Login. Below the header is a menu with categories like General Meeting, NB Members, Authorized Inspection Agencies, Owner-User Inspection Organizations, Review Team Leaders, and Test Lab. A sub-menu for Members Only includes National Board Inspection Code, Training, Commissions &amp; Certifications, Data Report Registration, and Pressure Relief Devices. The main content area features a link to Print All Synopses and a section for Related Documents, including ASME Codes, Standards, and Designators, and Stamping Requirements by Jurisdiction. The featured document is NB-370, National Board Synopsis, which is described as a compilation of jurisdiction laws, rules, and regulations set forth in a concise, easy-to-read format. It features the prevailing requirements, detailed contact information, and regulatory history for each jurisdiction.

# Code Case use (cont.)

- **Where** do I get them?
  - Purchase “book”
  - Subscribers to electronic Code books
  - Online: [cstools.asme.org](http://cstools.asme.org)

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Welcome Jay Cameron, PE (If you are not Jay Cameron, PE click [here](#).)

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UPDATE: C&S Connect is now supported on the Internet Explorer 10, Chrome, Firefox, and Safari web browsers.

Welcome to the ASME Codes & Standards Tools Website. Listed below are links to key web tools used by both Codes & Standards Staff and Volunteers to facilitate their Committee Process. While some tools provide open access to the Public others are "Members Only" and will require a username and password for access. For inquiries regarding member access, please contact your staff secretary.

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This page offers the first step to learn all you need know about C&S Connect.
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# Open Q&A on ASME materials

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Thank you

**Jay Cameron**

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