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

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HSB Global Standards

A.K.A.

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

Scope of Presentation

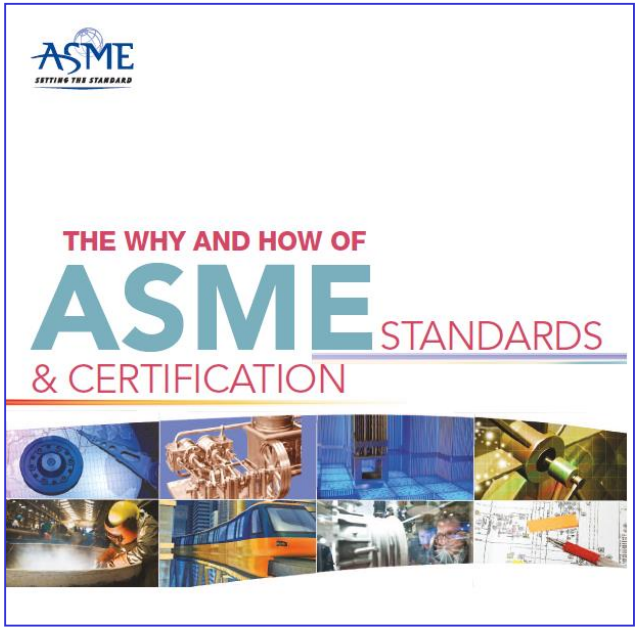
- What is a Code Case?
- History of Code Cases
- Process for developing a Code Case
- Current Code Cases for non-traditional materials manufacturing methods
- In-process Code Cases for the same
- Code Case use
- Open Q&A on ASME materials

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**
- 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:

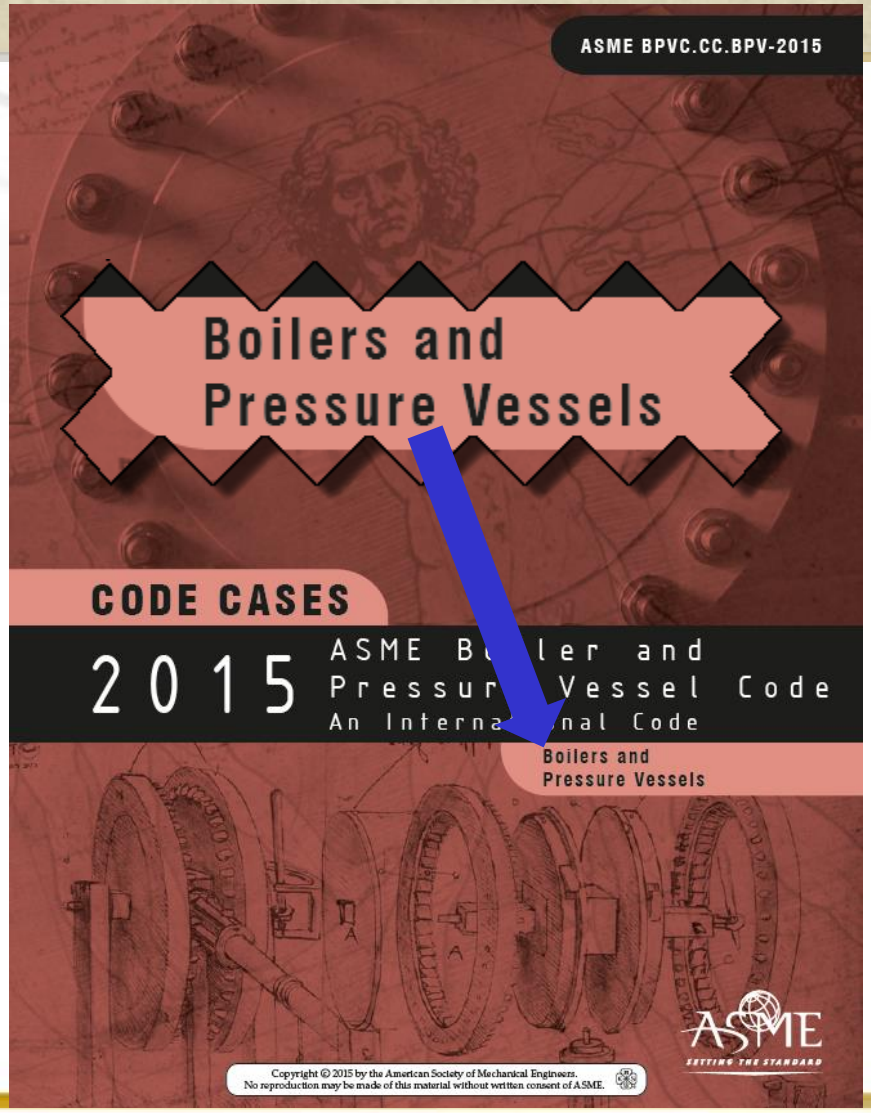
CODE CASES

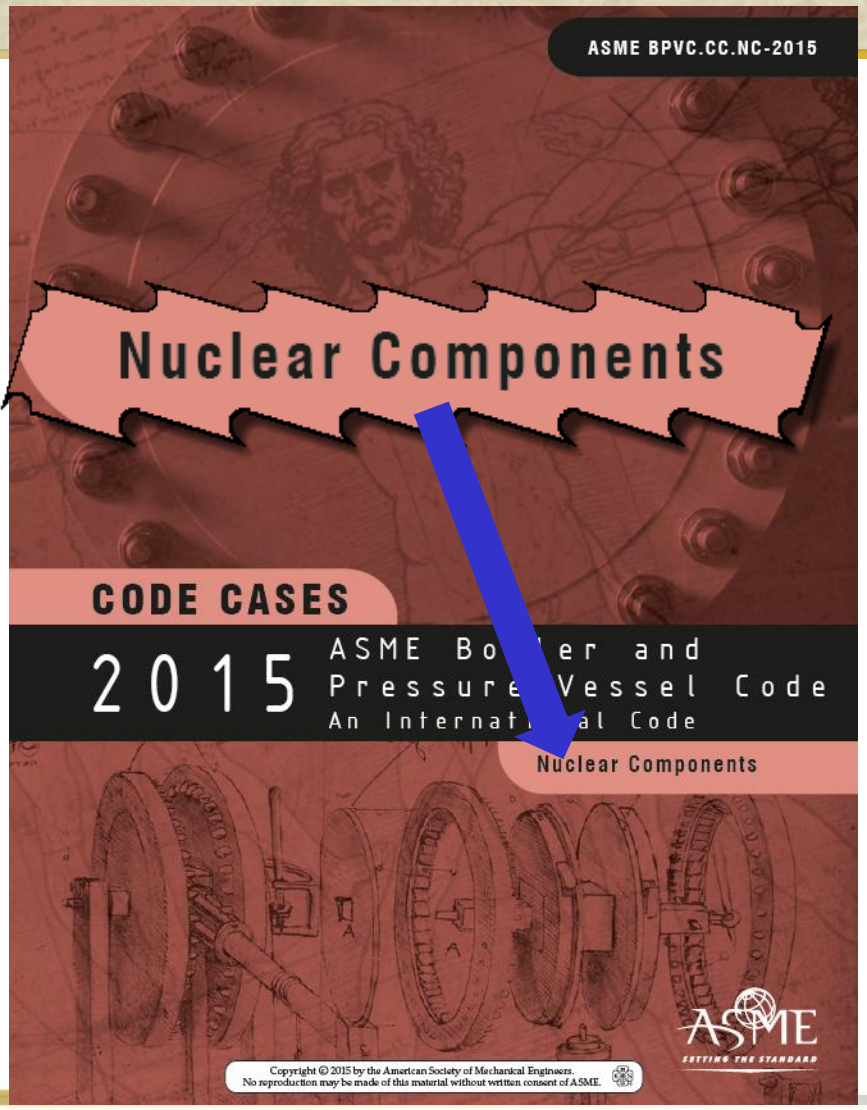
The Boiler and Pressure Vessel Code committees meet regularly to consider proposed additions and revisions to the Code and to formulate Cases to clarify the intent of existing requirements or provide, when the need is urgent, rules for materials or constructions not covered by existing Code rules. Those 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

Approval Date: December 18, 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) Centrifugally Cast Pipe, SA-

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

ASME BPVC.CC.BPV-2015

CASE
2179-8

Approval Date: June 28, 2012

CASE
2397

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

ensure that production valves will
as modeled above.
PG-73.3.3; or Section VIII, Divi-
the ... nts of either subpara.

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.

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 name-

(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.

CASES OF ASME BOILER

Approval Da

The ASME Boiler and Pressure Ves
eliminate Code Case expiration dates
all Code Cases listed in this Supplen
use until annulled by the ASME Boiler

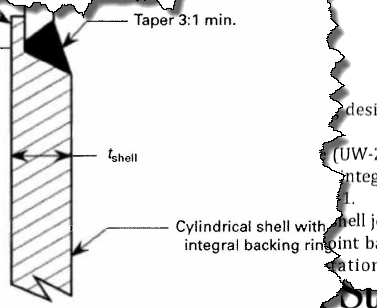
Case 2203-1
Omission of Lifting Device Requirements for Pressure Relief Valves on Air, Water Over 140°F, or Steam Service
Section VIII, Division 1

Reply: It is the opinion of the Co
requirements for a lifting device
UG-136(a)(3) may be omitted, provide
(a) The user has a documented proce
ated implementation program for the pe

ll Weld Detail

CASE
2751

spherical head



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

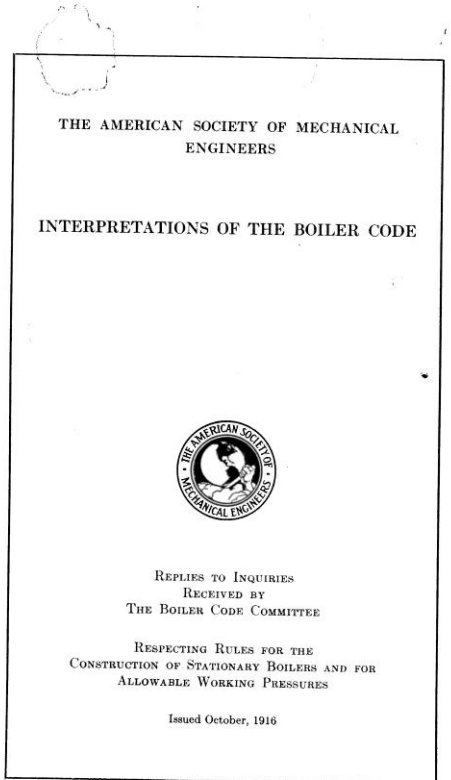
Inquiry: Under what co
head be attached to a cyli

design require-
(UW-2).
integral backing
1.
ell joint shall be
oint based on full
ations in Table

Standards

History of Code Cases

- Originally pu tation
  - also called al field
- First publish

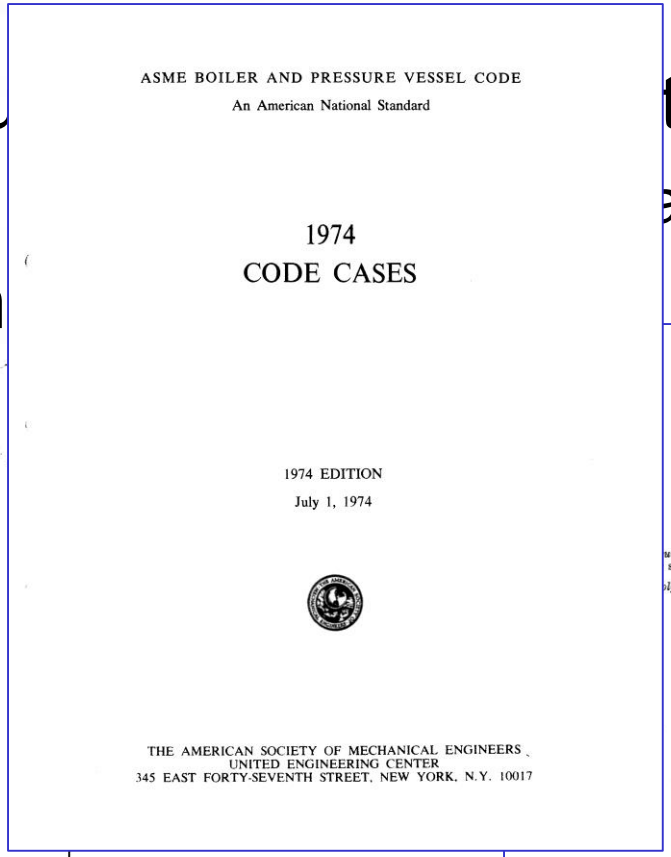

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

INTERPRETATIONS OF THE BOILER CODE

REPLIES TO INQUIRIES RECEIVED BY THE BOILER CODE COMMITTEE

RESPECTING RULES FOR THE CONSTRUCTION OF STATIONARY BOILERS AND FOR ALLOWABLE WORKING PRESSURES

Issued October, 1916


ASME BOILER AND PRESSURE VESSEL CODE

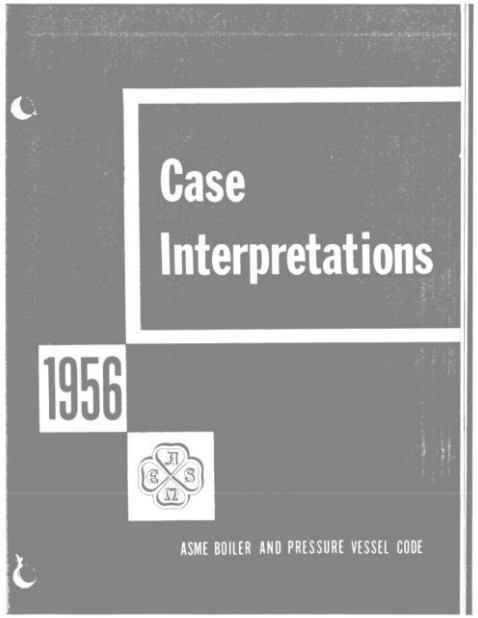
An American National Standard

1974
CODE CASES

1974 EDITION

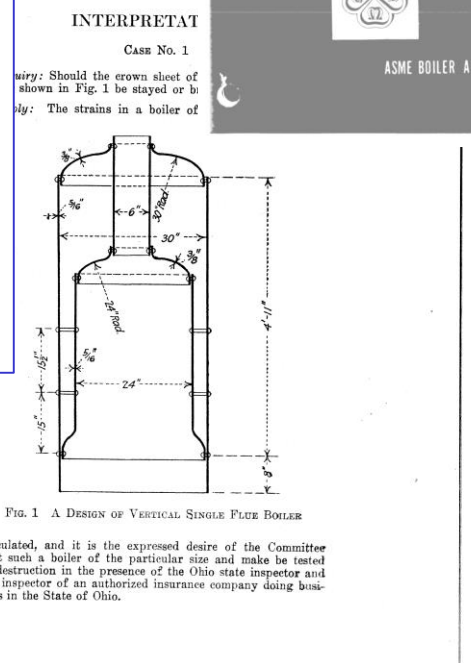
July 1, 1974

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
UNITED ENGINEERING CENTER
345 EAST FORTY-SEVENTH STREET, NEW YORK, N.Y. 10017


Case Interpretations

1956

ASME BOILER AND PRESSURE VESSEL CODE


INTERPRETAT

CASE NO. 1

uiry: Should the crown sheet of shown in Fig. 1 be stayed or b

ly: The strains in a boiler of

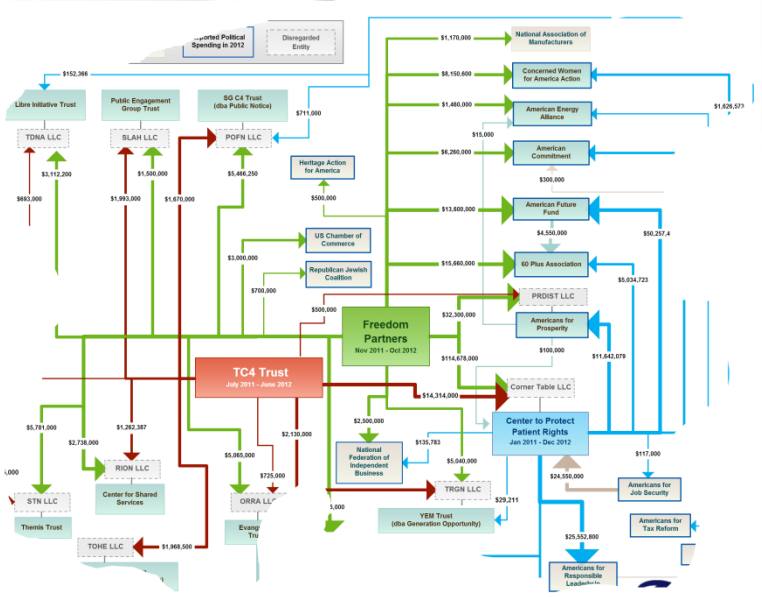
FIG. 1 A DESIGN OF VERTICAL SINGLE FLUE BOILER

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.

andards

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:



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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

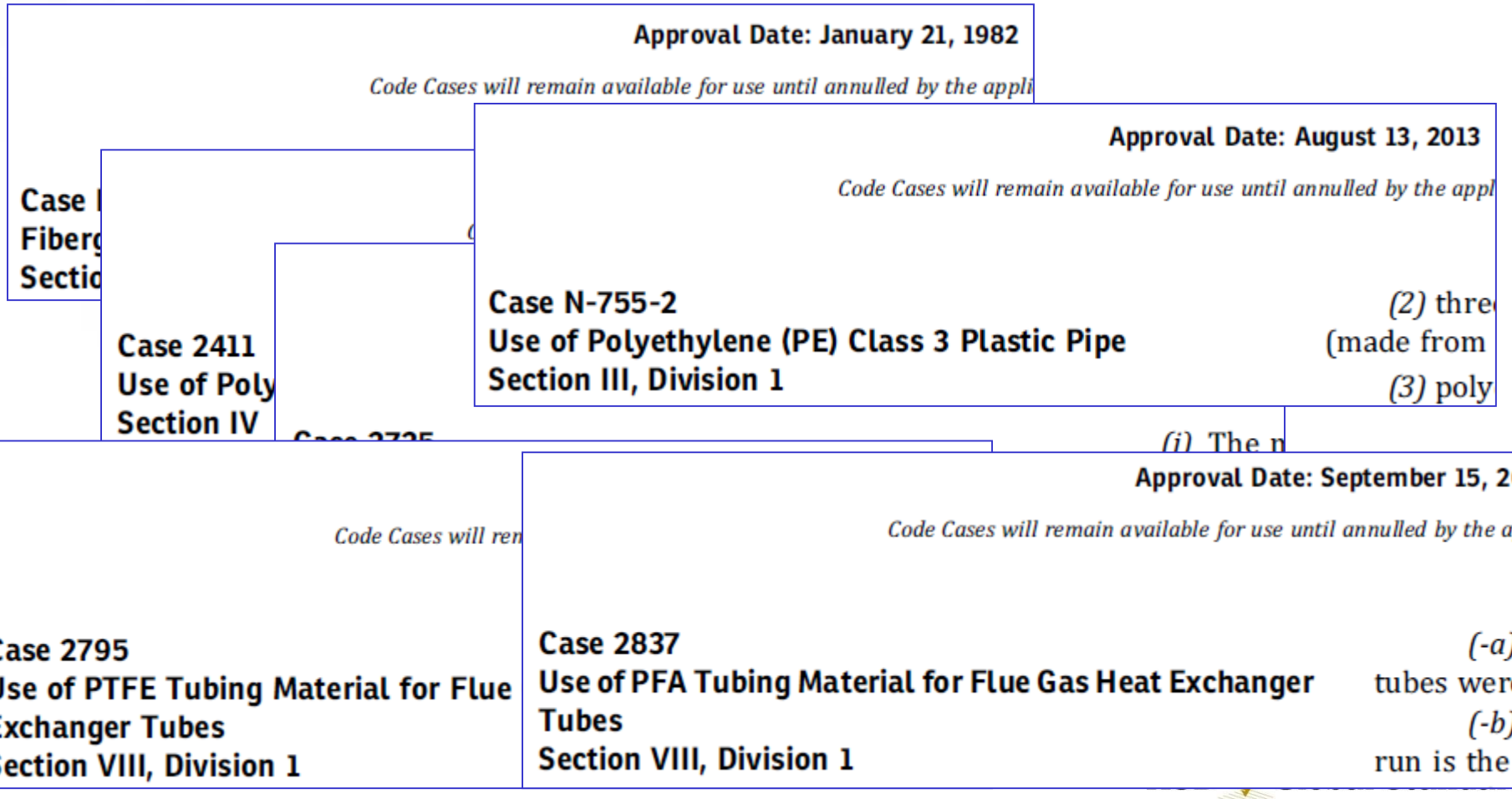
It is expected that requests for Code approval will normally be for materials for which there is a recognized national or international specification. It is the policy of the ASME Boiler and Pressure Vessel (BPV) Committee on Materials to approve, for inclusion in the Code Sections, only materials covered 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]

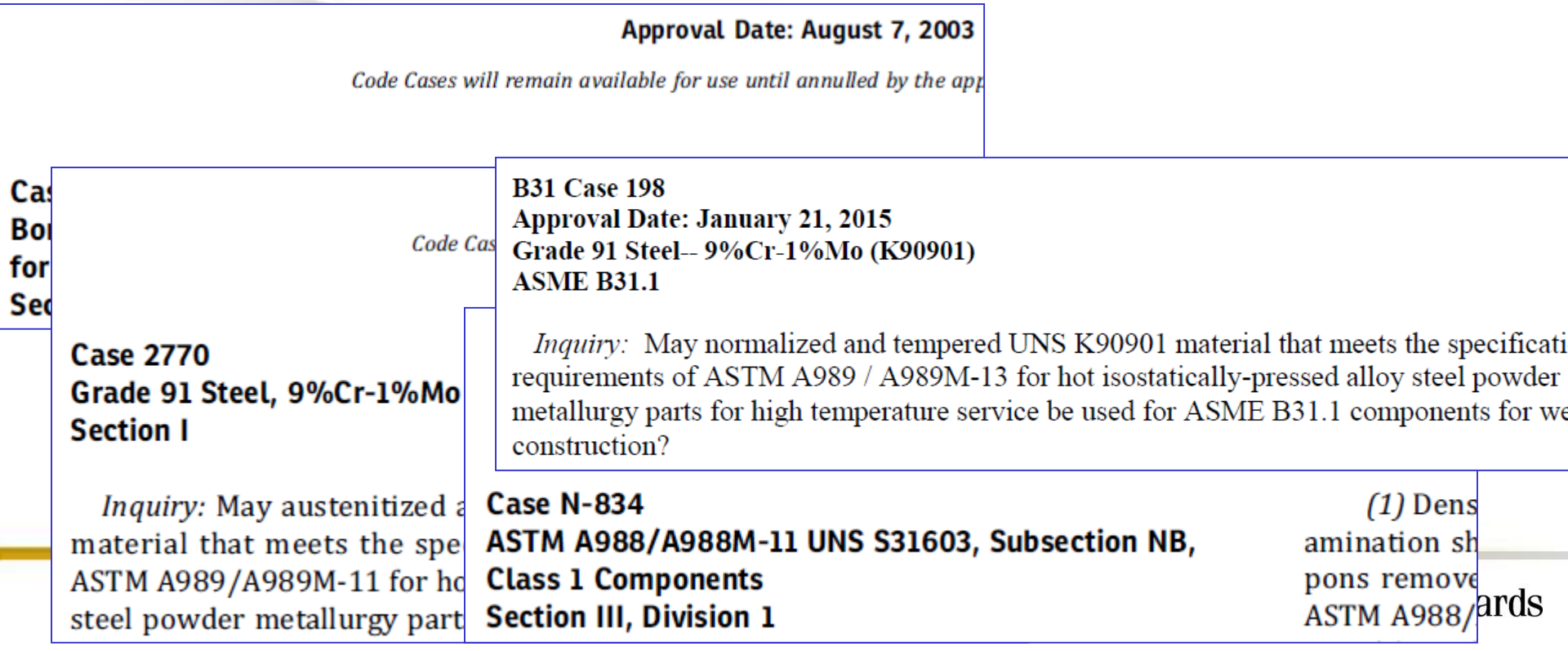
Current Code Cases for non-traditional materials manufacturing methods

- Polymer: Sections III, IV, VIII-1



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



In-process Code Cases for the same

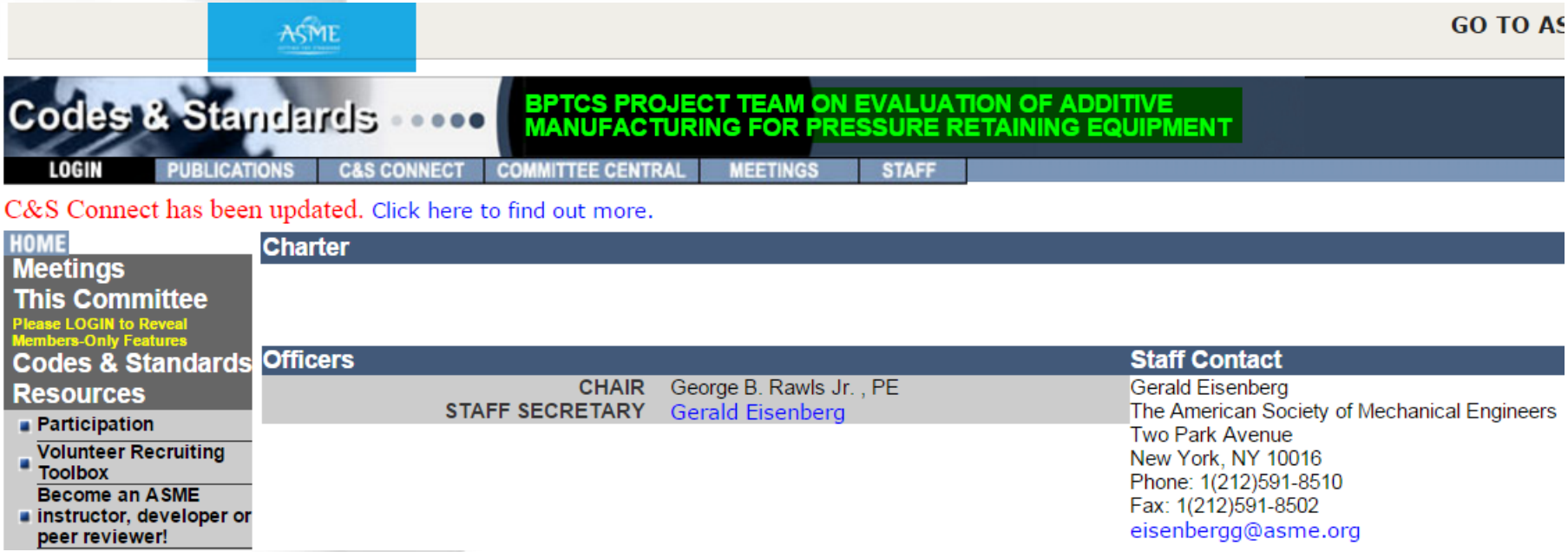
- Powder metal
  - Section I:
    - ASTM A988-13 S30400/03, S31600/03, S31725, S31254, N08367
    - ASTM A989-13 K90941 (9), K31545 (21), K21590 (22)
    - ASTM B834-13 N06600, N08367, N06625, N06690, N07718
  - B16.5/34/47:
    - ASTM A989-xx K90901 (91)
  - VIII-3:
    - ASTM Axxx “SA-723” HSLA

In-process Code Cases (cont.)

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

In-process Code Cases (cont.)

- Additive manufacturing



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

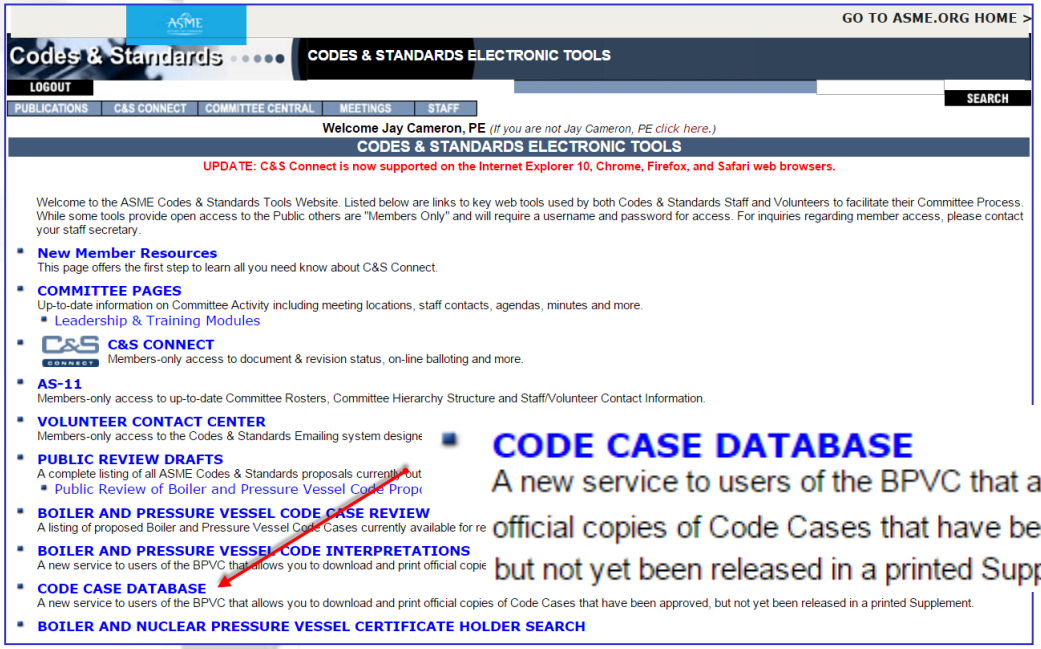
1. Manufactured and certified by ① (Name and address of Manufacturer)
2. Manufactured for ② (Name and address of Purchaser)
3. Location of installation ③ (Name and address)
4. Type ④ (Horizontal, vertical, or sphere) ⑤ (Tank, separator, jkt. vessel, heat exch., etc.) ⑧ (Manufacturer's serial number)
   ⑨ (CRN) ⑩ (Drawing number) ⑫ (National Board number) (Year built)
5. ASME Code, Section VIII, Div. 1 ⑬ [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

Code Case use (cont.)

- ***Where*** do I get them?
  - Purchase “book”
  - Subscribers to electronic Code books
  - Online: cstools.asme.org



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Open Q&A on ASME materials

???

Thank you

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