ASME B31.1

INTERPRETATIONS NO. 31

Replies to Technical Inquiries
July 1, 1997, Through December 31, 1997

It has been agreed to publish intepretations issued by the B31 Committee concerning B31.1 as part of the update service to the Code. The interpretations have been asssigned numbers in chronological order. Each interpretation applies either to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply.

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B31.1

Subject	Interpretation	File No.
104.3.3(C), Miter Bends for Low Pressure Steam Pipe	31-1	B31-96-028
132.4.1(A) and Table 132, Postweld Heat Treatment	31-2	B31-96-062

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STD.ASME B31.1 INT NO. 31-ENGL 0759670 0604669 127

Interpretation: 31-1

Subject: B31.1, Para. 104.3.3 (C), Miter Bends for Low Pressure Steam Pipe

Date Issued: July 15, 1997

File: B31-96-028

Question (1): Does ASME B31.1 permit the use of miter joints for steam services?

Reply (1): Yes, provided the rules of paras. 104.3.3(C) and 104.7 are met.

Question (2): May an alternative Code be used for this application?

Reply (2): When no Section of the ASME Code for Pressure Piping, specifically covers a pipng system, at his discretion the Owner may apply other code(s) (e.g., ASME B31.3). However, it is cautioned that supplementary requirements to the ASME B31 sections chosen may be necessary to provide a safe piping system for the intended application.

Interpretation: 31-2

Subject: B31.1, Para. 132.4.1(A) and Table 132, Postweld Heat Treatment

Date Issued: July 15, 1997

File: B31-96-062

Question: May para. 132.4.1 be used to determine the "nominal material thickness" in Table 132?

Reply: No. The nominal material thickness is the nominal thickness of the thicker of the materials being joined at the weld. Paragraph 132.4.1 is used for the determination of a thickness which may allow the exemption of PWHT for P-Nos. 1 and 3 materials only.

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ASME B31.1

INTERPRETATIONS NO. 30

Replies to Technical Inquiries
January 1, 1997, Through June 30, 1997

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service to the Code. The interpretations have been assigned numbers in chronological order. Each interpretation applies either to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. **These interpretations are not a part of the Code or the Addenda.**

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B31.1

Subject	Interpretation	File No.
100.1.2(A), Scope	30-2	B31-96-023
105.3, Nonmetallic Pipe and Appendix III, Nonmandatory Rules for Nonmetallic Piping	30-3	B31-96-026
137.4.4, Check of Test Equipment Before Applying Pressure	30-4	B31-96-027
Table A-3, Allowable Stress Values for A240 316 Material	30-1	B31-95-023

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Interpretation: 30-1

Subject: B31.1, Table A-3, Allowable Stress Values for A240 316 Material

Date Issued: April 1, 1997

File: B31-95-023

Question (1): Do the rules of ASME B31.1 permit use of the allowable stresses listed in Table A-3 for ASTM A240 316 material at temperatures above 1000°F when the carbon content of the material is less than 0.04%?

Reply (1): No. Refer to Table A-3, Note (10).

Question (2): Do the rules of ASME B31.1 permit the allowable stress values for ASTM A240 316L listed in ASME B31.3 to be used for ASTM A240 316 material with carbon content less than 0.04%?

Reply (2): No.

Question (3): Do the rules of ASME B31.1 permit the use of ASTM A240 316 material with carbon content less than 0.04% for piping in air service at 6 psig and 1200°F?

Reply (3): No.

Interpretation: 30-2

Subject: B31.1, Para. 100.1.2(A), Scope

Date Issued: April 1, 1997

File: B31-96-023

Question (1): Are pressure vessels fabricated and stamped in conformance with Para. U-1(h) of ASME Section VIII, Division 1, included in Para. 100.1.2(A) and related figures?

Reply (1): No.

Question (2): Is boiler external piping as defined in Para. 100.1.2(A) and related figures required for pressure vessels fabricated and stamped in conformance with Para. U-1(h) of ASME Section VIII, Division 1?

Reply (2): No.

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Interpretation: 30-3

Subject: B31.1, Para. 105.3, Nonmetallic Pipe and Appendix III, Nonmandatory Rules for Nonmetallic Piping

Date Issued: April 1, 1997

File: B31-96-026

Question (1): Under Para. 105.3, is it permissible to use nonmetallic piping for compressed air service?

Reply (1): Yes.

Question (2): Under Appendix III, is it permissible to use nonmetallic piping for compressed air service?

Reply (2): Appendix III is not applicable to air service (see Para. III-1.2.2).

Interpretation: 30-4

Subject: B31.1, Para. 137.4.4, Check of Test Equipment Before Applying Pressure

Date Issued: April 1, 1997

File: B31-96-027

Question (1): Is it required that the testing pressure pump and the supply line to the testing pressure pump be disconnected or isolated from the piping system that is under test during the test duration?

Reply (1): No.

Question (2): Is operation of the testing pressure pump during the test period to maintain test pressure allowed?

Reply (2): Yes.

Question (3): Is the pressure relief valve required to be located on the system under test or on the testing pressure pump?

Reply (3): The Code does not specify the location of the pressure relief valve during a hydrostatic test.

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ASME B31.1

Interpretations No. 29

Cases No. 23

Date of Issuance: September 30, 1997

This update contains Interpretations No. 29 and Cases No. 23.

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ASME B31.1

INTERPRETATIONS NO. 29

Replies to Technical Inquiries
July 1, 1996, Through December 31, 1996

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B31.1

Subject	Interpretation	File No.
100.2, 101.2, 102.2.4, 104, and 104.7.2	29-1	B31-95-019
122.1.7(C.1) and (C.2), Valves and Fittings	29-5	B31-96-031
127.4.5, 1989 Edition With 1991 Addenda, Seal Welding Threaded Joints	29-2	B31-96-002
127.5.3(B), Welder Performance Qualification	29-3	B31-96-029
137.7, Initial Service Testing	29-4	B31-96-030

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Interpretation: 29-1

Subject: B31.1, Paras. 100.2, 101.2, 102.2.4, 104, and 104.7.2

Date Issued: July 26, 1996

File: B31-95-019

Question (1): Does the B31.1 definition for *Engineering Design* include the *Internal Design Pressure* and allowances for corrosion?

Reply (1): Yes.

Question (2): Does B31.1 require that Engineering Design establish the internal design pressure prior to the maximum sustained operating pressure (MSOP)?

Reply (2): No.

Question (3): Does B31.1 require that Engineering Design establish the Internal Design Pressure of a piping system prior to the calculations for minimum wall thickness, branch connections, and the required reinforcement required for fabrication of branch connections, with or without added reinforcement?

Reply (3): Yes.

Question (4): Does B31.1 allow for an additional:
(a) 15% or
(b) 20%,
depending on the duration of the event, to be added to the applicable *SE* value of Appendix A, Table A-1 for the calculations effecting the minimum wall thickness (Para. 104.1.2)?

Reply (4): Yes, but for variations from normal operation only. Also, see Para. 101.1.

Question (5): When a piping system has been designed, fabricated, and installed without prior establishment of the piping system's internal design pressure, all allowances and tolerances, or pressure design of piping components (branch connections), does B31.1 allow the use of (A) or (B) of Para. 104.7.2 to verify acceptability of design?

Reply (5): No. Paragraph 104.7.2 is for the establishment of a component rating prior to its selection as a system component.

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Interpretation: 29-2

Subject: B31.1-1989 Edition With 1991 Addenda, Para. 127.4.5, Seal Welding Threaded Joints

Date Issued: July 26, 1996

File: B31-96-002

Question: May a fillet weld be used as a seal weld between a threaded pipe and a fitting to satisfy the requirements of Para. 127.4.5?

Reply: Yes, provided the exposed threads of the pipe are incorporated into the weld.

Interpretation: 29-3

Subject: B31.1, Para. 127.5.3(B), Welder Performance Qualification

Date Issued: November 14, 1996

File: B31-96-029

Question: Under the provisions of Para. 127.5.3(B), is it acceptable for a future employer to accept a welder performance qualification previously conducted by a trade union?

Reply: No. Paragraph 127.5.3(B) requires the original qualification to be done by an "employer." See Para. 127.5.2.

Interpretation: 29-4

Subject: B31.1, Para. 137.7, Initial Service Testing

Date Issued: November 14, 1996

File: B31-96-030

Question: Is it permitted to perform initial service testing per Para. 137.7 on insulated piping?

Reply: Yes. See Para. 137.2.1.

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Interpretation: 29-5

Subject: B31.1, Para. 122.1.7(C.1) and (C.2), Valves and Fittings

Date Issued: November 14, 1996

File: B31-96-031

Question: Do the rules of Para. 122.1.7(C) permit a gate valve to be used as a blowoff valve?

Reply: No. Paragraph 122.1.7(C.1) states, in part, "valves that have dams or pockets where sediment can collect, shall not be used on blowoff connections." This requirement precludes the use of ordinary gate valves for blowoff service.

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B31.1 — Cases No. 23

(The Cases are not part of ASME B31.1-1995 Edition or its Addenda.)

A Case is the official method of handling a reply to an inquiry when study indicates that the Code wording needs clarification, or when the reply modifies the existing requirements of the Code, or grants permission to use new materials or alternative constructions.

ASME has agreed to publish Cases issued by the B31 Committee concerning B31.1 as part of the update service to B31.1. The text of proposed new and revised Cases and reaffirmations of current Cases appear in *Mechanical Engineering* for public review. A notice also appears in *Mechanical Engineering* when new and revised Cases are approved. New and revised Cases, as well as announcements of reaffirmed Cases and annulments, then appear in the next update. All Cases currently in effect at the time of publication of the 1989 Edition of the Code were included in the update that immediately followed, Interpretations No. 14 and Cases No. 9. As of the 1992 and later Editions, all Cases currently in effect at the time of publication of an Edition are included with it as an update.

Cases No. 20, which is the update that was included after the last page of the 1995 Edition, contains the following Cases.

145	147	153	155-1	157	159	161	163
146-1	151	154	156	158	160	162	164

Cases 136-1, 148, and 149, which were included in the first update to the 1992 Edition, were allowed to expire.

The page numbers for the Cases supplements included with updates to the 1995 Edition start with C-1 and will continue consecutively through the last update to this Edition. The Cases affected by this Supplement are as follows:

Page	*Location*	*Change*
C-43	Case 168	Added

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Approval Date: June 1997

This Case shall expire on June 30, 2000, unless previously annulled or reaffirmed

Case 168
Use of Ultrasonic Examination in Lieu of Radiography for B31.1 Application

Inquiry: Under what conditions and limitations may an ultrasonic examination be used in lieu of radiography, when radiography is required in accordance with Table 136.4?

Reply: It is the opinion of this Committee that welds in pressure piping governed by the ASME B31.1 Code may be examined using the ultrasonic (UT) method in lieu of radiography (RT) at any time provided that all of the following requirements are met.

(a) The weld is greater than $\frac{1}{2}$ in. in thickness.

(b) The ultrasonic examination is performed using an ultrasonic system capable of recording the ultrasonic examination data, including scanning positions, to facilitate the analysis of the scan data by a third party and the repeatability of subsequent examinations, should they be required.

(c) Personnel performing and evaluating UT examinations shall be qualified and certified in accordance with their employer's written practice. Recommended Practice SNT-TC-1A, Personnel Qualification and Certification in Nondestructive Testing, shall be used as a guideline for employers to establish a written practice for qualifying and certifying personnel.

(d) In addition, personnel collecting and analyzing UT data shall have demonstrated their ability to perform an acceptable examination using test blocks approved by the Owner.

(e) Welds that are shown by ultrasonic examination to have discontinuities which produce an indication greater than 20% of the reference level shall be investigated to the extent that ultrasonic examination personnel can determine their shape, identity, and location so that they may evaluate each discontiniuity for acceptance in accordance with (1) and (2) below.

(1) Discontinuities evaluated as being cracks, lack of fusion, or incomplete penetration are unacceptable regardless of length.

(2) Other discontinuities are unacceptable if the indication exceeds the reference level and their length exceeds the following:

(a) $\frac{1}{4}$ in. (6.0 mm) for t up to $\frac{3}{4}$ in. (19.0 mm)

(b) $\frac{1}{3}t$ for t from $\frac{3}{4}$ in. (19.0 mm) to $2\frac{1}{4}$ in. (57.0 mm)

(c) $\frac{3}{4}$ in. (19.0 mm) for t over $2\frac{1}{4}$ in. (57.0 mm)

where t is the thickness of the weld being examined. If the weld joins two members having different thicknesses at the weld, t is the thinner of these two thicknesses.

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ASME B31.1

INTERPRETATIONS NO. 28

Replies to Technical Inquiries
January 1, 1996, Through June 30, 1996

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B31.1

Subject	Interpretation	File No.
105.2.1(A), Use of SA-312 Welded Pipe and Fittings	28-3	B31-94-044
122.1.6 and 122.3, Design Pressure of Instruments	28-6	B31-95-008
122.1.7(A.1) and (A.2), 1992 Edition, Steam Stop Valves	28-2	B31-94-005
122.5.1, Pressure Reducing Valves	28-1	B31-93-012
122.6.2(A), Discharge Piping from Pressure Relieving Safety Devices	28-4	B31-95-020
122.8.1, 1992 Edition, Materials for Flammable Gases	28-7	B31-94-006
131.1, 1986 Edition, Welding Preheat	28-5	B31-95-021

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Interpretation: 28-1

Subject: B31.1, Para. 122.5.1, Pressure Reducing Valves

Date Issued: January 5, 1996

File: B31-93-012

Question (1): Per ASME B31.1, Paras. 122.5.1 and 122.5.2, when multiple pressure reducing valves are connected in parallel in one station, is the capacity of the safety valve on the low pressure side required to be not less than the aggregate flow capacity of all the pressure reducing valves piped in parallel; thus assuming simultaneous failed open condition of all pressure reducing valves?

Reply (1): The Code does not specifically address situations involving multiple pressure reducing valves. However, in such cases, the Code requires protection against overpressure.

Question (2): Can a multiple pressure reducing valve station containing different sizes of pressure reducing valves be protected on the low pressure side by a relief device or devices with capacity equal to the flow capacity of the largest pressure reducing valve; thus providing over pressure relief from the failure of one or more PRV in the multiple valve station? In no case is the total steam capacity of the boiler exceeded. The equipment on the low pressure side is not designed for high side pressure.

Reply (2): The Code does not specifically address situations involving multiple pressure reducing valves. However, in such cases, the Code requires protection against overpressure.

Interpretation: 28-2

Subject: B31.1-1992 Edition, Para. 122.1.7(A.1) and (A.2), Steam Stop Valves

Date Issued: January 5, 1996

File: B31-94-005

Question (1): Per Para. 122.1.7 (A.1), may a valve (larger than NPS 2) with no external position indication be used as a steam stop valve?

Reply (1): No.

Question (2): In Para. 122.1.7 (A.2), does a swing check valve qualify as an automatic nonreturn valve for this service?

Reply (2): The Code does not define "automatic nonreturn valve".

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Interpretation: 28-3

Subject: B31.1, Para. 105.2.1(A), Use of SA-312 Welded Pipe and Fittings

Date Issued: January 5, 1996

File: B31-94-044

Question: Can ASME SA-312 and SA-403 welded pipe and fittings be utilized for flammable or combustible fluids?

Reply: Yes, but as limited by Paras. 122.7.3 and 122.8.1.

Interpretation: 28-4

Subject: B31.1, Para. 122.6.2(A), Discharge Piping from Pressure Relieving Safety Devices

Date Issued: January 5, 1996

File: B31-95-020

Question: Does the placement of a manual stop valve in pressure relief discharge piping meet the intent of ANSI B31.1-1967, Para. 122.6.2(A), if the stop valve is verified fully locked-open prior to and periodically during service via plant administrative controls?

Reply: No.

Interpretation: 28-5

Subject: B31.1-1986 Edition, Para. 131.1, Welding Preheat

Date Issued: January 5, 1996

File: B31-95-021

Question (1): Is the mandatory preheat of Para. 131 applicable to all welds made on ASME B31.1 piping, including both temporary and permanent welds?

Reply (1): Yes, see Para. 127.4.10.

Question (2): Is the mandatory preheat of Para. 131 applicable to thermal cutting or gouging?

Reply (2): No. However, it may be required per Para. 127.4.11 for certain hardenable alloys.

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STD.ASME B31.1 INT NO. 28-ENGL 1996 ■ 0759670 0578949 199 ■

Interpretation: 28-6

Subject: B31.1, Paras. 122.1.6 and 122.3, Design Pressure of Instruments

Date Issued: May 2, 1996

File: B31-95-008

Question (1): For Section I boilers stamped with an MAWP considerably higher than the operating pressure, is it permissible for instrumentation within the scope of boiler external piping to have pressure ratings lower than the MAWP of the boiler but equal to or greater than the lowest set safety valve pressure?

Reply (1): Instruments are excluded from B31.1 [see Para. 100.1.3(H)]. Paragraph 100.1.1 states that the requirements for boiler appurtenances shall be in accordance with Section I of the ASME Boiler and Pressure Vessel Code, Para. PG-60. The P–T rating of instruments which serve a Section I boiler, but located in B31.1 piping, should be compatible with the design conditions of that piping.

Question (2): For Section I boilers stamped with a MAWP considerably higher than the operating pressure, is it permissible for instrumentation beyond the scope of the boiler external piping to have pressure ratings lower than the MAWP of the boiler but equal to or greater than the lowest set safety valve pressure?

Reply (2): Instruments are excluded from B31.1 [see Para. 100.1.3(H)]. Paragraph 100.1.1 states that the requirements for boiler appurtenances shall be in accordance with Section I of the ASME Boiler and Pressure Vessel Code, Para. PG-60. The P–T rating of instruments which serve a Section I boiler, but located in B31.1 piping, should be compatible with the design conditions of that piping.

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Interpretation: 28-7

Subject: B31.1-1992 Edition, Para. 122.8.1, Materials for Flammable Gases

Date Issued: May 2, 1996

File: B31-94-006

Question (1): Does ASME B31.1 require the use of only seamless pipe for fuel gas (i.e., natural gas, manufactured gas) piping?

Reply (1): No, except that furnace butt welded pipe shall not be used per Para. 105.2.1(A).

Question (2): Does ASME B31.1 place any limitation on the pressure and temperature for use of ASTM A 283, plate rolled and welded for fuel gas piping?

Reply (2): Yes, the use of ASTM A 283 is limited to temperature of 650°F or less by Table A-1. Design limitations are controlled by Chapter II, Para. 102 Design Criteria. The designer should also take into consideration joint efficiency of the final pipe product form and wall thickness pursuant to the requirements of Paras. 103 and 104.

Question (3): Does ASME B31.1 recommend any specific nonmandatory testing for fuel gas piping?

Reply (3): No.

Question (4): Does ASME B31.1 apply to fuel gas piping for flare stacks, both cold flare and with pilot flare, including the flare stacks?

Reply (4): Yes, unless excluded by Para. 100.1.3.

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ASME B31.1

Interpretations No. 27

Date of Issuance: September 30, 1996

This update contains only Interpretations No. 27; there are no cases included.

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ASME B31.1 INTERPRETATIONS NO. 27

Replies to Technical Inquiries
July 1, 1995, Through December 31, 1995

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Interpretations Nos. 2 through 7 were included with the update service to the 1983 Edition and Interpretations Nos. 8 through 13 were included with the update service to the 1986 Edition. Interpretations Nos. 14 through 19 were included with the update service to the 1989 Edition. Interpretations Nos. 20 through 25 were included with the update service to the 1992 Edition. For the 1995 Edition, interpretations will be issued as necessary up to twice a year until the publication of the 1998 Edition.

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B31.1

Subject	Interpretation	File No.
117.3, Use of Copper Tubing	27-3	B31-94-055
122, Maximum Sustained Operating Pressure	27-2	B31-94-043
Table 121.5, Suggested Pipe Support Spacing	27-1	B31-94-022

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Interpretation: 27-1

Subject: B31.1, Table 121.5, Suggested Pipe Support Spacing

Date Issued: August 25, 1995

File: B31-94-022

Question (1): Does the ASME/ANSI B31.1 Power Piping Code indicate the method to be used to calculate the maximum spacing between supports?

Reply (1): No. Either Para. 121.5 shall apply when calculations are made or Table 121.5 may be used when calculations are not made.

Question (2): When support spacing is based on span calculations rather than Table 121.5, does ASME/ANSI B31.1 limit sag between supports?

Reply (2): No. However, Para. 121.5 states that spans shall be such that excessive sag is prevented. When determining limits on sag, the designer should consider factors, such as fluid contents, slope of line, pipe material, and drain locations.

Interpretation: 27-2

Subject: B31.1, 122, Maximum Sustained Operating Pressure

Date Issued: August 25, 1995

File: B31-94-043

Question (1): What is the criteria for determining the maximum sustained operating pressure (MSOP) for steam piping?

Reply (1): As referenced in Paras. 122.1.1 and 122.1.2, it is the responsibility of the designer to determine the MSOP by considering all of the expected operating conditions, not necessarily continuous, to permit satisfactory operation of the steam piping.

Question (2): Is it possible for the MSOP and the design pressure to be equal?

Reply (2): Yes, also see Para. 101.2.2.

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Interpretation: 27-3

Subject: B31.1, 117.3, Use of Copper Tubing

Date Issued: August 25, 1995

File: B31-94-055

Question: Does Para. 117.3 permit the use of copper tubing with braze socket type joints for natural gas (and other flammable gases except hydrogen)?

Reply: No. Material limitations for use in flammable gas service are covered in Para. 122.8.1.

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ASME B31.1

INTERPRETATIONS NO. 25

Replies to Technical Inquiries
January 1, 1994, Through June 30, 1994

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service to the Code. The interpretations have been assigned numbers in chronological order. Each interpretation applies either to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. **These interpretations are not a part of the Code or the Addenda.**

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B31.1

Subject	Interpretation	File No.
100.1.3(C), Design Pressure	25-13	B31-92-067
101.5, Dynamic Effects	25-5	B31-93-13
102.2.4, Variation from Normal Operation	25-2	B31-92-068
104.1.2(A.1), Minimum Wall Thickness of Pipe	25-20	B31-94-11
104.3.1, Branch Connections	25-3	B31-92-071
104.8, Analysis of Piping Components	25-16	B31-93-040
107, Valves for Vacuum Service	25-18	B31-94-08
118, Sleeve Coupled and Proprietary Joints	25-19	B31-94-10
122, Design of Specific Piping Systems	25-17	B31-94-07
122, Installation of Safety Valves	25-8	B31-93-037
122.1.1(A), Pressure Design for BEP	25-6	B31-93-18
122.6.2(D), Pressure Relief Devices	25-4	B31-93-11
122.7.3(B), Piping for Flammable Liquids	25-14	B31-92-036
127.4.2, Circumferential Weld Surface Contours	25-1	B31-90-035
127.4.2(D)	25-11	B31-93-48
135, Pipe Assembly Tolerances	25-21	B31-94-021
136.4.2, Visual Inspection	25-7	B31-93-023
136.4.2, Visual Inspection	25-10	B31-93-047
137.3.2, Testing of Nonboiler External Piping	25-9	B31-93-038
137.3.2 and 137.7.1, Hydrostatic Test	25-12	B31-93-043
Appendix D, Welding Tee per B16.9	25-15	B31-93-14
Fig. 127.4.4(C), Minimum Welding Dimensions	25-22	B31-94-023
Table 132, Postweld Heat Treatment	25-24	B31-94-027
Table 136.4, Nondestructive Examination Requirements	25-23	B31-94-024

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ASME B31.1*INT NO.*25 ** 0759670 0551402 406

Interpretation: 25-1

Subject: B31.1, 127.4.2, Circumferential Weld Surface Contours

Date Issued: March 15, 1994

File: B31-90-035

Question (1): When not specified by the designer, is it permissible to fabricate a weld which partially fills the groove between pipe, between fittings, or between pipe and a fitting so long as the minimum wall thickness requirement of Para. 104.1.2 is met and a transition between the weld surface and the pipe or fitting surface is provided in accordance with Para. 127.4.2(C)?

Reply (1): No.

Question (2): When specified by the designer, is it permissible to fabricate a weld which partially fills the groove between pipe, between fittings, or between pipe and a fitting so long as the minimum wall thickness requirement of Para. 104.1.2 is met and a transition between the weld surface and the pipe or fitting surface is provided in accordance with Para. 127.4.2(C)?

Reply (2): Yes.

Interpretation: 25-2

Subject: B31.1, 102.2.4, Variation from Normal Operation

Date Issued: March 15, 1994

File: B31-92-068

Question: When considering variations from normal thermal operating cycles, can the right side term of Eq. (13A), Para. 104.8.3, be multiplied by the 1.15 or 1.20 values contained in Para. 102.2.4?

Reply: No. The increases in allowable stresses for pressure design permitted by Para. 102.3.2(A) and for occasional loads permitted by Para. 102.3.3(A), are not permitted in the evaluation of cyclic stress ranges. Paragraph 102.2.4 provides limitations for pressure stress magnitudes, whereas the right hand side of Eq. (13) is a limitation for cyclic thermal expansion stress ranges.

Interpretation: 25-3

Subject: B31.1, 104.3.1, Branch Connections

Date Issued: March 15, 1994

File: B31-92-071

Question: In accordance with Para. 104.3.1(C.1), does a tee manufactured to ANSI B16.9 meet the pressure requirements of ASME B31.1, as far as reinforcement in the crotch is concerned?

Reply: Yes. However, further consideration may be necessary for other loadings.

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Interpretation: 25-4

Subject: B31.1, 122.6.2(D), Pressure Relief Devices

Date Issued: March 15, 1994

File: B31-93-11

Question: Does Para. 122.6.2(D) of ASME B31.1 require that discharge lines from pressure relieving safety devices be designed to facilitate drainage of any expected accumulation?

Reply: Yes.

Interpretation: 25-5

Subject: B31.1, 101.5, Dynamic Effects

Date Issued: March 15, 1994

File: B31-93-13

Question: Is it the intent of ASME B31.1, Para. 101.5, that dynamic effects of earthquake, impact, wind, and vibration must be considered by the piping designer, even if not specified by the owner?

Reply: Yes. Consideration may or may not involve analysis.

Interpretation: 25-6

Subject: B31.1, 122.1.1(A), Pressure Design for BEP

Date Issued: March 15, 1994

File: B31-93-18

Question: This Inquiry relates to Boiler External Piping, as defined in Para. 100.1.2(A) of ASME B31.1, for steam service. The set pressure of the boiler safety valve is less than the maximum allowable working pressure of the boiler. Is it permissible to use the set pressure of the boiler safety valve as the internal design pressure for the steam piping?

Reply: Yes, provided that all applicable requirements of Paras. 122.1.1(A) and 122.1.2 of ASME B31.1 are met and the internal design pressure for the steam piping is not less than 100 psig.

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ASME B31.1*INT NO.*25 ** 0759670 0551404 289

Interpretation: 25-7

Subject: B31.1, 136.4.2, Visual Inspection

Date Issued: March 15, 1994

File: B31-93-023

Question (1): May the required visual examination of the completed weld occur after the pressure test required by Para. 137?

Reply (1): The ASME B31.1 Code does not specify when the required examination of the completed welds should be performed.

Question (2): Is it a requirement of the ASME B31.1 Code that the fabrication sequence shall be arranged so as to provide for making the maximum number of joint inside surfaces "readily accessible" for examination for incomplete penetration?

Reply (2): No.

Question (3): Paragraph 136.4.2 of the ASME B31.1 Code references "portions of a component." What is the definition of a component?

Reply (3): Component is defined in Para. 100.2.

Question (4): Is it required that the required visual examination occur "before, during, or after the manufacture, fabrication, assembly, or test" as stated in the ASME B31.1 Code, Para. 136.4.2?

Reply (4): No. Visual examinations may occur whenever the examiner wishes to be present. However, it is required that the completed weld receive a visual examination that verifies that the completed weld meets the acceptance criteria of Para. 136.4.2.

Question (5): What inspections are required by the ASME B31.1 Code?

Reply (5): The inspections required are those that the Owner's inspector (as defined in Para. 136.1) or the Authorized Inspector (as required when the system is Boiler External Piping) has determined to be needed in order to assure the piping has been constructed in accordance with the applicable requirements of the ASME B31.1 Code.

Interpretation: 25-8

Subject: B31.1, 122, Installation of Safety Valves

Date Issued: March 15, 1994

File: B31-93-037

Question: Does ASME B31.1 require that valves, addressed within the scope of Para. 122, be installed with the valve stem either at or above the horizontal plane to prevent entrapment of liquids within the valve bonnet?

Reply: No. The inquirer is referred to Para. 107.1(C).

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Interpretation: 25-9

Subject: B31.1, Para. 137.3.2, Testing of Nonboiler External Piping

Date Issued: March 15, 1994

File: B31-93-038

Question (1): For piping used with a hot water boiler designed for 150 psig and 210°F, are the test requirements of Para. 137.3.2 applicable?

Reply (1): Yes.

Question (2): For the above referenced piping, are full penetration welds required?

Reply (2): Yes, except for welds designed in accordance with Para. 104.3.1(C.2) and fabricated in accordance with Para. 127.4.8(F).

Interpretation: 25-10

Subject: B31.1, 136.4.2, Visual Inspection

Date Issued: March 15, 1994

File: B31-93-047

Question: Does ASME B31.1 set an acceptable limit for acceptance of surface porosity found by visual examination?

Reply: No.

Interpretation: 25-11

Subject: B31.1-1967, 127.4.2(D)

Date Issued: March 15, 1994

File: B31-93-48

Question: Does the reinforcement requirements detailed in USAS B31.1-1967 Edition, Para. 127.4.2(D), apply to the root reinforcement of single V butt weld pipe joints?

Reply: No.

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ASME B31.1*INT NO.*25 ** 0759670 0551406 051

Interpretation: 25-12

Subject: B31.1, 137.3.2 and 137.7.1, Hydrostatic Test

Date Issued: April 22, 1994

File: B31-93-043

Question (1): Does ASME B31.1 define the term "not practical" in Para. 137.7.1?

Reply (1): No. It is the responsibility of the owner to determine which test shall be done on NBEP. See Para. 137.3.2

Question (2): Does ASME B31.1 exempt piping, valves, and fittings NPS 1 inch and less from hydrostatic test requirements?

Reply (2): No.

Interpretation: 25-13

Subject: B31.1, 100.1.3(C), Design Pressure

Date Issued: April 29, 1994

File: B31-92-067

Question: What rules of ASME B31.1 apply to the design pressure of piping downstream of a pressure reducing valve?

Reply: The design pressure of piping downstream of a pressure reducing valve shall be determined in accordance with the rules of Para. 101.2.2. Where the design pressure is less than that of the piping upstream of the pressure reducing valve, the requirements of Para. 122.5 shall be met.

Interpretation: 25-14

Subject: B31.1, 122.7.3(B), Piping for Flammable Liquids

Date Issued: June 22, 1994

File: B31-92-036

Question (1): For flammable and combustible liquids, does ASME B31.1, Para. 122.7.3(B), permit the use of copper tubing, where metal temperatures do not exceed 400°F, to match the copper alloy fittings permitted in this paragraph?

Reply (1): No. The allowance applies only to copper alloy valves and fittings.

Question (2): Does Para. 122.7.3(C) permit copper tube and copper alloy valves and fittings in areas having metal temperatures between 400°F and 500°F?

Reply (2): No.

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ASME B31.1*INT NO.*25 ** 0759670 0551407 T98

Interpretation: 25-15

Subject: B31.1, Appendix D, Welding Tee per B16.9

Date Issued: June 22, 1994

File: B31-93-14

Question (1): May the applicable flexibility and stress intensification factors in B31.1, Appendix D, be used for a welding tee manufactured in accordance with ASME/ANSI B16.9 without supplementary dimensional specifications?

Reply (1): Yes.

Question (2): Is the manufacturer of a welding tee specified for use in B31.1 piping system and manufactured in accordance to ASME/ANSI B16.9 without supplementary dimensional specifications obliged to comply with any requirements of ASME B31.1, Appendix D?

Reply (2): No.

Interpretation: 25-16

Subject: B31.1, 104.8, Analysis of Piping Components

Date Issued: June 22, 1994

File: B31-93-040

Question: Referring to Para. 104.8.4, Eqs. (11), (12), and (13), how should the moment values for sustained and occasional loads, M_A and M_B, and the moment-range value for thermal expansion M_C be determined considering the effect that varying gaps may exist between the pipe and its supports at different times during operation?

Reply: The Code does not specify how to calculate moments and moment-ranges due to different loads or combinations of loads. In the determination of loads, gaps produce nonlinearities in the analyses which may often be considered negligible.

Interpretation: 25-17

Subject: B31.1-1992, 122, Design of Specific Piping Systems

Date Issued: June 22, 1994

File: B31-94-07

Question: Does Para. 122 of ASME B31.1 Code require that eccentric reducers with flat side up be provided upstream of pressure control valves when the valves are sized smaller than the pipeline?

Reply: No.

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ASME B31.1*INT NO.*25 ** 0759670 0551408 924

Interpretation: 25-18

Subject: B31.1-1992, 107, Valves for Vacuum Service

Date Issued: June 22, 1994

File: B31-94-08

Question: Does ASME B31.1 require that valves used in vacuum service have an external sealing arrangement, such as seal water to gland packing, to prevent air from entering the system.

Reply: No.

Interpretation: 25-19

Subject: B31.1-1992, 118, Sleeve Coupled and Proprietary Joints

Date Issued: June 22, 1994

File: B31-94-10

Question: Does Para. 118 of ASME B31.1 Code require tie-rods (control units) to meet the requirement for "adequate provision to prevent separation of the joint"?

Reply: No.

Interpretation: 25-20

Subject: B31.1-1989, 104.1.2(A.1), Minimum Wall Thickness of Pipe

Date Issued: June 22, 1994

File: B31-94-11

Question (1): May a measured minimum wall thickness of pipe be used to verify B31.1 Power Piping Code compliance with the design minimum wall thickness?

Reply (1): Yes.

Question (2): What Code or Standard must be used to measure the pipe wall thickness?

Reply (2): The Code does not specify how to measure the pipe wall thickness?

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ASME B31.1*INT NO.*25 ** 0759670 0551409 860

Interpretation: 25-21

Subject: B31.1, 135, Pipe Assembly Tolerances

Date Issued: June 22, 1994

File: B31-94-021

Question: Does piping fabricated to the fabrication tolerances of PFI Standard ES-5 (Fabricating Tolerances) meet the requirements of ASME B31.1?

Reply: ASME B31.1 does not specify the fabricating tolerances. This is a responsibility of the designer.

Interpretation: 25-22

Subject: B31.1, Fig. 127.4.4(C), Minimum Welding Dimensions

Date Issued: June 22, 1994

File: B31-94-023

Question: In Fig. 127.4.4(C), is a maximum weld size specified?

Reply: No. However, the weld size may be limited by the physical configuration of the joint.

Interpretation: 25-23

Subject: B31.1, Table 136.4, Nondestructive Examination Requirements

Date Issued: June 22, 1994

File: B31-94-024

Question: In Table 136.4, for buttwelds on piping over NPS 2, is radiography required for all pressures, regardless of the design temperature?

Reply: No.

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ASME B31.1*INT NO.*25 ** 0759670 0551410 582

Interpretation: 25-24

Subject: B31.1, Table 132, Postweld Heat Treatment

Date Issued: June 22, 1994

File: B31-94-027

Question: Is the "nominal thickness in accordance with Para. 132.4.1" the same as the "nominal material thickness," mentioned in Notes (I)(B) for P-Nos. 1 and 3 in Table 132?

Reply: No. The "nominal thickness in accordance with Para. 132.4.1" may be the weld thickness under some specified conditions but the "nominal material thickness" is always the material thickness.

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B31.1 — Cases No. 19

The Cases are not part of ASME B31.1-1992 Edition or its Addenda

A Case is the official method of handling a reply to an inquiry when study indicates that the Code wording needs clarification, or when the reply modifies the existing requirements of the Code, or grants permission to use new materials or alternative constructions.

ASME has agreed to publish Cases issued by the B31 Committee concerning B31.1 as part of the update service to B31.1. The text of proposed new and revised Cases and reaffirmations of current Cases appear in *Mechanical Engineering* for public review. A notice also appears in *Mechanical Engineering* when new and revised Cases are approved. New and revised Cases, as well as announcements of reaffirmed Cases and annulments, then appear in the next update. All Cases currently in effect at the time of publication of the 1989 Edition of the Code were included in the update that immediately followed, Interpretations No. 14 and Cases No. 9. Subsequently, all Cases currently in effect at the time of publication of a new Edition are to be included with it as an update.

Cases No. 14, which was the update included with the 1992 Edition, contains the following Cases.

136-1	147	149	153	155	157
145	148	151	154	156	158

Case 146-1, which was inadvertently omitted from Cases No. 14, was added by Errata in Cases No. 16. Cases 139, 143, 144, and 150, which were included in updates to the 1989 Edition, were allowed to expire.

The page numbers for the Cases supplements included with updates to the 1992 Edition start with C-1 and will continue consecutively through the last update to this Edition. The Cases affected by this supplement are as follows:

Page	*Location*	*Change*
C-3	Case 145	(1) Reaffirmed: July 1994 (2) New expiration date: July 31, 1997

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ASME B31.1

Interpretations No. 24

Date of Issuance: June 30, 1994

This update contains only Interpretations No. 24; there are no cases included.

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ASME B31.1

INTERPRETATIONS NO. 24

Replies to Technical Inquiries
July 1, 1993, Through December 31, 1993

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service to the Code. The interpretations have been assigned numbers in chronological order. Each interpretation applies either to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. **These interpretations are not a part of the Code or the Addenda.**

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B31.1

Subject	Interpretation	File
104.3.1(B.4) and 127.4.8, Branch Connections	24-3	B31-92-063, B31-92-065
122.7.1, Piping for Flammable Liquids	24-1	B31-92-040
122.7.3(A), Materials	24-2	B31-92-033
Table 127.4.2, Reinforcement of Butt Welds	24-4	B31-92-070
Table 132, Postweld Heat Treatment	24-5	B31-93-015

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Interpretation: 24-1

Subject: B31.1, 122.7.1, Piping for Flammable Liquids

Date Issued: July 14, 1993

File: B31-92-040

Question: Must pipe used for LPG (liquid propane) be seamless if it is installed in areas having open flames or exposed to surfaces operating over 500°F?

Reply: No.

Interpretation: 24-2

Subject: B31.1, 122.7.3(A), Materials

Date Issued: August 26, 1993

File: B31-92-033

Question: In Para. 122.7.3(A) for flammable or combustible liquids, does the requirement that "steel piping material be used" include the fittings, valves, and other components as well?

Reply: Yes.

Interpretation: 24-3

Subject: B31.1, 104.3.1(B.4) and 127.4.8, Branch Connections

Date Issued: October 27, 1993

File: B31-92-063, B31-92-065

Question: Do the rules of ASME B31.1 permit installation of NPS 2 and smaller welded branch connection fittings directly on butt-welded fittings or on pipe-to-pipe, pipe-to-fitting, and fitting-to-fitting butt welds in the run piping?

Reply: Yes, provided the requirements of Paras. 104.3.1, 104.8, and 127.4.8 are met. It is the responsibility of the designer to determine appropriate stress intensification i factors for such configurations. For installation directly on fittings or on pipe-to-fitting and fitting-to-fitting butt welds, the requirements of Para. 104.7 shall be met, and the recommendations of the fitting manufacturer, if available, shall be followed.

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Interpretation: 24-4

Subject: B31.1, Table 127.4.2, Reinforcement of Butt Welds

Date Issued: October 27, 1993

File: B31-92-070

Question: Is it permissible to apply the maximum reinforcement limit of Table 127.4.2 to the inside surface of single welded butt joints for the purpose of penetrameter selection in accordance with ASME Section V, T-276.1?

Reply: No.

Interpretation: 24-5

Subject: B31.1, Table 132, Postweld Heat Treatment

Date Issued: October 27, 1993

File: B31-93-015

Question: Is it permissible to postweld heat treat SA-182 F91 material at 1400°F–1450°F instead of 1300°F–1400°F as specified for P-No. 5 in Table 132?

Reply: Yes, provided the lower critical temperature of the SA-182 F91 material is not exceeded. See Para. 132.2(A).

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ASME B31.1

INTERPRETATIONS NO. 23

Replies to Technical Inquiries
January 1, 1993, Through June 30, 1993

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service to the Code. The interpretations have been assigned numbers in chronological order. Each interpretation applies either to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. **These interpretations are not a part of the Code or the Addenda.**

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B31.1

Subject	Interpetation	File
100.1.2, Power Piping Systems	23-6	B31-92-069
117.3, Brazed Socket Type Joints	23-4	B31-92-032
122.1, Design Requirements	23-2	B31-91-048
122.3.3, Control Piping	23-3	B31-92-026
122.8.1(B), Flammable Gas Piping	23-5	B31-92-035
Fig. 127.4.8(E), Welds of Branch Connections	23-1	B31-92-025

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Interpretation: 23-1

Subject: B31.1, Fig. 127.4.8(E), Welds of Branch Connections

Date Issued: January 15, 1993

File: B31-92-025

Question: What dimensional requirements apply to the cover fillet of a specially designed and tested integrally reinforced branch connection fitting, which does not meet the requirements of ANSI B16.11?

Reply: The attachment of the fitting may be in accordance with Para. 127.4.8(B) and specifically Fig. 127.4.8(D) sketch (a) where t_{nb} is taken to be the thickness of the fitting at the point of attachment.

Interpretation: 23-2

Subject: B31.1, 122.1, Design Requirements

Date Issued: June 17, 1993

File: B31-91-048

Question: What is the required pressure rating for a bronze feedwater and blowdown valve on a 150 psi (ASME Section I) firetube boiler? [Paragraph 122.1.7(C.5) indicates the class for cast iron only.]

Reply: ASME B31.1 does not delineate specific rules regarding feedwater and blowdown piping systems for firetube boilers. Feedwater valve requirements are contained in ASME B31.1, Paras. 122.1.3 and 122.1.7(B). Blowdown valve requirements are contained in ASME B31.1, Para. 122.1.4(B).

Interpretation: 23-3

Subject: B31.1, 122.3.3, Control Piping

Date Issued: June 17, 1993

File: B31-92-026

Question: Does ASME B31.1, Paras. 122.3.2(B) and 122.3.6 allow on fuel gas piping, a shutoff valve between the header and instrument that is threaded on both ends?

Reply: If unavoidable, threaded valves are permitted. Refer to Para. 122.8.1 for the limitations applicable to threaded piping for flammable gas service.

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ASME B31.1*INT NO.*23 ** 0759670 0550555 734

Interpretation: 23-4

Subject: B31.1, 117.3, Brazed Socket Type Joints

Date Issued: June 17, 1993

File: B31-92-032

Question: Does ASME B31.1, Para. 117.3 permit the use of brazed socket-type joints for flammable gas?

Reply: Yes, except in areas where fire hazards are involved. Refer to Para. 100.2 for the definition of "fire hazard."

Interpretation: 23-5

Subject: B31.1, 122.8.1(B), Flammable Gas Piping

Date Issued: June 17, 1993

File: B31-92-035

Question (1): In Para. 122.8.1(B) for flammable gas piping, does "steel piping material" include pipe, valves, fittings, and other components as well?

Reply (1): Yes.

Question (2): Are ductile iron fittings permitted by Para. 122.8.1?

Reply (2): No.

Interpretation: 23-6

Subject: B31.1, 100.1.2, Power Piping Systems

Date Issued: June 17, 1993

File: B31-92-069

Question: In a power plant, is piping for a water purification system for boiler feedwater within the scope of ASME B31.1?

Reply: Yes.

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B31.1 – Cases No. 18

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Cases No. 14, which was the update included with the 1992 Edition, contains the following Cases.

136-1	147	149	153	155	157
145	148	151	154	156	158

Case 146-1, which was inadvertently omitted from Cases No. 14, was added by Errata in Cases No. 16. Cases 139, 143, 144, and 150, which were included in updates to the 1989 Edition, were allowed to expire.

The page numbers for the Cases supplements included with updates to the 1992 Edition start with C-1 and will continue consecutively through the last update to this Edition. The Cases affected by this supplement are as follows:

Page	*Location*	*Change*
C-5	Case 147	(1) Reaffirmed: August 1993 (2) New expiration date: August 31, 1996
C-15	Case 153	(1) Reaffirmed: November 1992 (2) New expiration date: November 30, 1995
C-17	Case 154	(1) Reaffirmed: October 1992 (2) New expiration date: October 31, 1995
C-21	Case 156	(1) Reaffirmed: August 1993 (2) New expiration date: August 31, 1996
C-23	Case 157	(1) Reaffirmed: September 1993 (2) New expiration date: September 30, 1996
C-25	Case 158	(1) Reaffirmed: November 1993 (2) New expiration date: November 30, 1996

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ASME B31.1

Interpretations No. 22

Cases No. 17

Date of Issuance: June 30, 1993

This update contains Interpretations No. 22 and Cases No. 17.

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ASME B31.1

INTERPRETATIONS NO. 22

Replies to Technical Inquiries
July 1, 1992, Through December 31, 1992

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B31.1

Subject	Interpretation	File No.
105, Materials	22-6	B31-92-024
122.1.4, Blow-Off Valves	22-3	B31-92-08
127.2.3, Consumable Inserts	22-5	B31-92-023
127.4, Welding Requirements	22-7	B31-92-027
132.1 and 132.4, Postweld Heat Treatment	22-1	B31-92-07
137.1.2(B), Design Pressure	22-2	B31-91-046
Fig. 127.4.8(E), Welds of Branch Connections	22-4	B31-92-28

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Interpretation: 22-1

Subject: B31.1, 132.1 and 132.4, Postweld Heat Treatment

Date Issued: August 21, 1992

File: B31-92-07

Question: Where Table 132 states "maximum material thickness," does this include the weld fitting wall thickness at the weldment of pipe to fitting?

Reply: Yes.

Interpretation: 22-2

Subject: B31.1, 137.1.2(B), Design Pressure

Date Issued: October 30, 1992

File: B31-91-046

Question: Is it the intent of USAS B31.1-1967, Para. 137.1.2 (B), that "Design Pressure" means "Normal Operating Pressure"?

Reply: Yes.

Interpretation: 22-3

Subject: B31.1, 122.1.4, Blow-Off Valves

Date Issued: October 30, 1992

File: B31-92-08

Question: Reference is made to the requirements of ASME B31.1 Power Piping Code, Para. 122.1.4(A.1) versus those of Para. 122.1.7. Which pressure should be used in the design of blow-off valves whether they are bronze, cast iron, or steel?

Reply: The design pressure of blow-off valves, used in establishing the pressure–temperature ratings of a valve manufactured in accordance with the valves listed in Table 126.1, shall exceed the maximum allowable working pressure of the boiler by either 25% or 225 psi, whichever is less, but shall not be less than 100 psig.

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Interpretation: 22-4

Subject: B31.1, Fig. 127.4.8(E), Welds of Branch Connections

Date Issued: October 30, 1992

File: B31-92-28

Question: Is a tolerance allowed on the $\frac{1}{16}$ in. gap dimension shown in the left hand figure of Fig. 127.4.8(E).

Reply: Yes. The welding procedure specification (WPS) shall describe the acceptable tolerance on the gap dimensions.

Interpretation: 22-5

Subject: B31.1, 127.2.3, Consumable Inserts

Date Issued: December 10, 1992

File: B31-92-023

Question: If a WPS has been qualified without the use of a consumable insert, does Para. 127.2.3 require that the WPS be requalified using a consumable insert if consumable inserts are to be used in production welding.

Reply: No.

Interpretation: 22-6

Subject: B31.1, 105, Materials

Date Issued: December 10, 1992

File: B31-92-024

Question: Is it mandatory that the material of components in an ASME B31.1 Power Piping System be the same as the material of the pipe?

Reply: No.

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Interpretation: 22-7

Subject: B31.1, 127.4, Welding Requirements

Date Issued: December 10, 1992

File: B31-92-027

Question: Does the B31.1 Code require that a minimum distance be maintained between adjacent piping welds.

Reply: No. However, refer to Para. 104.3.1(G.7) for rules regarding the reinforcement of multiple openings.

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B31.1 – Cases No. 17

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Page	*Location*	*Change*
C-19, C-20	Case 155-1	Case 155 reaffirmed as Case 155-1 and revised as follows: (1) For Table 2: (a) B 804 added in two places under Welded Pipe (b) Second stress line under Welded Pipe revised at 750°F (2) For Table 3, B 804 added

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This case shall expire on June 30, 1996, unless previously annulled or reaffirmed

CASE 155-1
June 1993

CASES
CODE FOR PRESSURE PIPING — B31

Case 155-1 Use of UNS N08367 Material in ASME B31.1 Construction

Inquiry: Under what conditions may solution annealed UNS NO8367 material, with the chemical composition listed in Table 1 and the tensile properties listed in Table 2, and otherwise conforming the requirements of specifications listed in Table 3, be used in the construction of power piping systems under the rules of ASME B31.1?

Reply: It is the opinion of the Committee that the material described in the Inquiry may be used for both welded and unwelded construction under the rules of ASME B31.1 provided the following additional requirements are met.

(a) The allowable stress values shall be those listed in Table 2.

(b) For external pressure design, refer to para. 104.1.3.

(c) Welding Procedure Qualification and performance qualification shall be conducted as prescribed in Section IX. The material shall be considered to be P-No. 45. Preheat is neither required nor prohibited.

(d) Heat treatment after forming or welding is neither required nor prohibited. However, if heat treatment is applied, the solution annealing treatment shall consist of heating to a minimum temperature of 2025°F and then quenching in water or rapidly cooling by other means.

(e) All other requirements of ASME B31.1 shall apply.

(f) This material is not acceptable for use on boiler external piping.

TABLE 1
CHEMICAL REQUIREMENTS

Element	Heat Analysis Limit, % Wt	Product Analysis Variations, Under Minimum or Over Maximum of the Heat Analysis Limit
Carbon, max.	0.03	0.01
Manganese, max.	2.00	0.04
Phosphorus, max.	0.040	0.005
Sulfur, max.	0.030	0.005
Silicon, max.	1.00	0.05
Chromium	20.0–22.0	0.2
Nickel	23.5–25.5	0.2
Molybdenum	6.0–7.0	0.1
Nitrogen	0.18–0.25	0.01
Iron [Note (1)]	Balance	. . .

NOTE:
(1) Determined arithmetically by difference.

For Table 2, see next page.

TABLE 3
PRODUCT SPECIFICATION

B 366	Fittings
B 462	Forgings
B 564	Forgings
B 675	Welded pipe
B 676	Welded tube
B 688	Plate, sheet, strip
B 690	Seamless pipe and tube
B 691	Rod, bar
B 804	Welded pipe

Case 155-1 continues on next page

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CASES
CODE FOR PRESSURE PIPING — B31

TABLE 2
MECHANICAL PROPERTIES AND MAXIMUM ALLOWABLE DESIGN STRESS VALUES IN TENSION, ksi, FOR METAL TEMPERATURE, °F, NOT EXCEEDING TEMPERATURES LISTED BELOW [SEE ALSO NOTE (1)]

		Tensile Strength Minimum	Yield Strength Minimum	E	−20 to 100	200	300	400	500	600	650	700	750	800
Smls Pipe/Tube														
B 690	All sizes	104	46	1.00	26.0	26.0	24.3	22.7	20.9	19.9	19.3	19.3	18.7	18.4
B 690 [Note (2)]	All sizes	104	46	1.00	26.2	26.0	24.5	23.5	22.8	22.3	22.1	22.1	21.8	21.7
Welded Pipe														
B 675, B 804	All sizes	95	45	0.85	20.2	20.2	19.1	18.2	17.3	16.6	16.1	15.8	15.6	15.3
B 675 [Note (2)], B 804 [Note (2)]	All sizes	95	45	0.85	20.2	20.2	19.1	18.2	17.8	17.3	17.2	17.0	16.9	16.8
Welded Tube														
B 676	All sizes	100	45	0.85	21.3	21.3	20.1	18.9	17.3	16.6	16.1	15.8	15.6	15.3
B 676 [Note (2)]	All sizes	100	45	0.85	21.3	21.3	20.1	19.2	18.7	18.4	18.1	17.9	17.9	17.8
Plate, Sheet, Strip														
B 688	< 3/16 in. thk.	104	46	1.00	26.0	26.0	24.3	22.7	20.9	19.9	19.3	19.3	18.7	18.4
	3/16–¾ in. thk.	100	45	1.00	25.0	25.0	23.7	22.2	20.4	19.5	18.9	18.6	18.3	18.0
	> ¾ in. thk.	95	45	1.00	23.8	23.8	22.5	21.4	20.4	19.5	18.9	18.6	18.3	18.0
B 688 [Note (2)]	< 3/16 in. thk.	104	46	1.00	26.2	26.0	24.5	23.5	22.8	22.3	22.1	22.1	21.8	21.7
	3/16–¾ in. thk.	100	45	1.00	25.0	25.0	23.7	22.6	22.0	21.7	21.3	21.1	21.1	20.9
	> ¾ in. thk.	95	45	1.00	23.8	23.8	22.5	21.4	20.9	20.4	20.2	20.0	19.9	19.8
Rod and Bar														
B 691	All sizes	95	45	1.00	23.8	23.8	22.5	21.4	20.4	19.5	18.9	18.6	18.3	18.0
B 691 [Note (2)]	All sizes	95	45	1.00	23.8	23.8	22.5	21.4	20.9	20.4	20.2	20.0	19.9	19.8
Forgings														
B 564	All sizes	95	45	1.00	23.8	23.8	22.5	21.4	20.4	19.5	18.9	18.6	18.3	18.0
B 564 [Note (2)]	All sizes	95	45	1.00	23.8	23.8	22.5	21.4	20.9	20.4	20.2	20.0	19.9	19.8
Forged or Rolled Pipe Flanges, Forged Fittings and Valves														
B 462	All sizes	95	45	1.00	23.8	23.8	22.5	21.4	20.4	19.5	18.9	18.6	18.3	18.0
B 462 [Note (2)]	All sizes	95	45	1.00	23.8	23.8	22.5	21.4	20.9	20.4	20.2	20.0	19.9	19.8
Wrought Welding Fittings														
B 366	All sizes	95	45	1.00	23.8	23.8	22.5	21.4	20.4	19.5	18.9	18.6	18.3	18.0
B 366 [Note (2)]	All sizes	95	45	1.00	23.8	23.8	22.5	21.4	20.9	20.4	20.2	20.0	19.9	19.8

NOTES:
(1) Elongation in 2 in., or $4D$, min. = 30%.
(2) Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short time tensile properties govern to permit the use of these alloys where slightly greater deformation in acceptable. These stress values exceed 67%, but do not exceed 90% of the yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These values should not be used for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction.

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ASME B31.1

INTERPRETATIONS NO. 21

Replies to Technical Inquiries
January 1, 1992, Through June 30, 1992

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B31.1

Subject	Interpretation	File
104.1, Pressure Design of Components	21-4	B31-91-045
114.1 and 114.2.3, Threaded Insertion Type Flow Sensors	21-7	B31-90-020
121, Design of Pipe Supporting Elements	21-5	B31-91-030
121.7, Supporting Structures; 100.1.2, Jurisdictional Limits	21-6	B31-91-049
122.8.2, Piping for Toxic Fluids	21-3	B31-90-066
Piping Connecting Pieces of Mechanical Equipment	21-2	B31-88-016
Scope of Application to Pulp and Paper Mills	21-1	B31-90-67A

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Interpretation: 21-1

Subject: B31.1, Scope of Application to Pulp and Paper Mills

Date Issued: February 7, 1992

File: B31-90-67A

Question: Which ASME B31 Code is applicable to piping systems designed for the collection and conveying of toxic noncondensible gases in pulp and paper mills?

Reply: The applicable Code for such a system depends upon its purpose. If the toxic gases are used as part of a chemical process, 31.3 applies. If they are used as a working fluid or as part of a power generation loop, B31.1 applies. If the piping is clearly not in the scope of either of these B31 Codes, the tenth paragraph of the Introduction to B31.1 permits the user to select any B31 Code Section determined to be generally applicable.

Interpretation: 21-2

Subject: B31.1, Piping Connecting Pieces of Mechanical Equipment

Date Issued: February 21, 1992

File: B31-88-016

Question: Does B31.1 apply to piping used to transfer steam from the exhaust connection of an intermediate pressure turbine to the inlet connection of a low pressure turbine? The piping is 84 in. in diameter, 260 ft long with design conditions of 128 psig and 636°F.

Reply: Yes.

Note: This interpretation is intended only to apply to a specific instance; the issue of general applicability is under consideration by the B31 Committee.

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Interpretation: 21-3

Subject: B31.1, 122.8.2, Piping for Toxic Fluids

Date Issued: March 19, 1992

File: B31-90-066

Question (1): Does the wall thickness requirements of Para. 122.8.2(B) apply to nonsteel piping materials?

Reply (1): No; however, the requirements of Para. 104.1.2 shall be met.

Question (2):
(a) Does Para. 122.8.2(C) apply to piping connections at metering pumps?
(b) Are metering pumps considered to be associated with a container?

Reply (2):
(a) Yes.
(b) No.

Interpretation: 21-4

Subject: B31.1, 104.1, Pressure Design of Components

Date Issued: March 19, 1992

File: B31-91-045

Question: Is it the intent of ASME B31.1 that if the actual tensile strength of the material is greater than the minimum tensile strength identified in Appendix A, a proportionately greater value for *SE* may be used in the "Design Pressure Calculation of Para. 104.1"?

Reply: No.

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Interpretation: 21-5

Subject: B31.1, 121, Design of Pipe Supporting Elements

Date Issued: June 17, 1992

File: B31-91-030

Question (1): Do Para. 121 requirements apply only to the design and manufacture of "standard types of pipe hanger components" as defined in MSS SP-58 ?

Reply (1): No.

Question (2): Does Para. 121.2 allow the use of stress values other than those given in MSS SP-58 or Appendix A.

Reply (2): Yes, see Paras. 121.2(B) and (C).

Interpretation: 21-6

Subject: B31.1, 121.7, Supporting Structures; 100.1.2, Jurisdictional Limits

Date Issued: June 17, 1992

File: B31-91-049

Question (1): Is the structure which resists the piping loads transmitted through pipe hangers and supports within the scope of the B31.1 Code?

Reply (1): No, except as discussed in Para. 121.9.

Question (2): Does the B31.1 Code give recommendations or requirements for the materials used in the construction of the structures described above?

Reply (2): No.

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Interpretation: 21-7

Subject: B31.1, 114.1 and 114.2.3, Threaded Insertion Type Flow Sensors

Date Issued: June 22, 1992

File: B31-90-020

Question (1): Is the manufacturer and/or fabricator of a pipe fitting or component responsible for providing materials, components, and workmanship compliance with B31.1?

Reply (1): Yes, if ASME B31.1 is specified as the jurisdictional Code.

Question (2): Is a threaded insertion type flow sensor governed by Paras. 114.2.3 and 114.1?

Reply (2): The threaded connection is governed by Paras. 114.1 and 114.2.3. The design and installation of the insertion device should be adequate to withstand the effects of the fluid characteristics, fluid flow, and vibration.

Question (3): If the response to Question (2) is yes, does a polypropylene insertion flow sensor which is retained in the service by its threaded connection meet the intents and purposes of Paras. 114.2.3 and 114.1?

Reply (3): A polypropylene insertion type flow sensor which is retained in the service by its threaded connection can meet the intents and purposes of Paras. 114.1 and 114.2.3.

Question (4): Paragraph 122.9 states "where it is necessary" plastic materials may be used to convey corrosive or hazardous liquids. Should this paragraph be interpreted as prohibiting the use of thermoplastics for conveying corrosive or hazardous liquids when the use of thermoplastics is not "necessary"?

Reply (4): No

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B31.1 — Cases No. 16

The Cases are not part of ASME B31.1-1992 Edition or its Addenda

A Case is the official method of handling a reply to an inquiry when study indicates that the Code wording needs clarification, or when the reply modifies the existing requirements of the Code, or grants permission to use new materials or alternative constructions.

ASME has agreed to publish Cases issued by the B31 Committee concerning B31.1 as part of the update service to B31.1. The text of proposed new and revised Cases and reaffirmations of current Cases appear in *Mechanical Engineering* for public review. A notice also appears in *Mechanical Engineering* when new and revised Cases are approved. New and revised Cases, as well as announcements of reaffirmed Cases and annulments, then appear in the next update. All Cases currently in effect at the time of publication of the 1989 Edition of the Code were included in the update that immediately followed, Interpretations No. 14 and Cases No. 9. Subsequently, all Cases currently in effect at the time of publication of a new Edition are to be included with it as an update.

Cases No. 14, which was the update included with the 1992 Edition, contains the following Cases.

136-1	153
145	154
147	155
148	156
149	157
151	158

Cases 139, 143, 144, and 150, which were included in updates to the 1989 Edtion, were allowed to expire.

The page numbers for the Cases supplement included with updates to the 1992 Edition start with C-1 and will continue consecutively through the last update to this Edition. The Cases affected by this supplement are as follows:

Page	*Location*	*Change*
C-4.1	Case 146-1	Added by Errata (Reaffirmed March 1992 but inadvertently omitted from Cases No. 14)
C-31	Case 161	Added
C-33	Case 162	Added

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This Case shall expire on March 31, 1995, unless previously annulled or reaffirmed

Case 146-1
March 1989
Reaffirmed March 1992

CASES
CODE FOR PRESSURE PIPING — B31

Case 146-1 Nickel–Chromium–Molybdenum–Columbium Alloy (UNS N06625) in ASME B31.1 Construction

Inquiry: May nickel–chromium–molybdenum–columbium alloy (UNS N06625) conforming to the specifications listed in Table I be used for construction of ASME B31.1 Power Piping systems?

Reply: It is the opinion of the Committee that nickel–chromium–molybdenum–columbium alloy (UNS N06625) conforming to the product specifications shown in Table I may be used in the construction of power piping complying with the rules of ASME B31.1, provided the following additional requirements are met.

(1) THESE MATERIALS SHALL NOT BE USED FOR BOILER EXTERNAL PIPING. See Para. 100.1.2(A)

(2) The allowable stress values shall be those listed in Table II.

(3) All longitudinal welds in any of the materials listed in Table I shall be completely examined by radiography. Radiographic examination shall be in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section VIII, latest edition, Para. UW-51.

(4) The welding procedure qualification and performance qualifications shall be conducted in accordance with ASME Boiler and Pressure Vessel Code, Section IX. For qualifying welding procedures, the material is P-No. 43.

(5) Postweld heat treatment of this material is neither required nor prohibited. However, no postweld heat treatment shall be performed except by agreement between the owner and the manufacturer, installer, or erector. The temperature, time, and method of heat treatment shall be covered by the agreement.

(6) Longitudinally seam welded pipe, with or without filler metal added, is permitted. Longitudinally seam welded pipe shall be fabricated from plate meeting the requirements of ASTM B 443. All seam welded pipe shall comply with the following requirements.

(a) The welds shall be made by an electric arc process.

(b) The joints shall be full penetration double-welded or single-welded butt joints employing fusion welding processes, as defined under Para. 100.2 Definitions of ASME B31.1. Where backing rings or strips are used, the ring or strip material shall be of the same P-Number as the plate being joined. Backing rings or strips shall be completely removed after welding, prior to radiography, and the exposed weld surface shall be examined visually for conformance to the requirement of the following paragraph. Welds made by procedures using backing rings which remain in place are prohibited.

(c) The weld surface on the outside diameter side of the pipe shall be flush with the base plate or shall have a reasonably uniform crown in accordance with Table 127.4.2 of ASME B31.1. The weld reinforcement on the inside diameter side of the pipe may be removed at the manufacturer's option or by agreement between the manufacturer and purchaser. The contour of the reinforcement shall be reasonably smooth and free of irregularities. The deposited metal shall be fused uniformly into the plate surface. No concavity of contour is permitted.

(d) Weld defects shall be repaired by removal to sound metal and rewelding. Subsequent heat treatment and inspection shall be as required on the original welds.

(e) When heat treatment is required, such heat treatment shall be done in accordance with Para. 5, after all welding.

Case 146-1 continues on following page.

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March 1989
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CASES
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(f) The requirements of ASTM A 530 for welded pipe shall be met. Variations in wall thickness and length for longitudinally seam welded pipe with filler metal added shall be the same as required in ASTM A 530 for seamless or longitudinally seam welded pipe without filler metal.

Case 146-1 continues on following page.

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Case 146-1
March 1989
Reaffirmed March 1992

CASES
CODE FOR PRESSURE PIPING — B31

TABLE I

Plate, Sheet, and Strip	B 443-84
Seamless Pipe and Tube	B 444-84
Rod and Bar	B 446-84
Forgings	B 564-86
Wrought Fittings	B 366-87

TABLE II
ALLOWABLE STRESS VALUES

Spec No.	Metal Temp. [Note (1)], °F, Not Exceeding	Allowable [Notes (2), (3)] Stress Values, ksi	Spec No.	Metal Temp. [Note (1)], °F, Not Exceeding	Allowable [Notes (2), (4)] Stress Values, ksi
B 443 Grade 1	300	27.5	B 443 Grade 2	100	25.0
B 444 Grade 1	400	26.8	B 444 Grade 2	200	24.6
B 446 Grade 1	500	26.1	B 446 Grade 2	300	24.0
B 564	600	25.4	B 366 (made	400	22.5
B 366 (made	700	25.0	with Grade 2	500	21.7
with Grade 1	800	24.6	material)	600	21.0
material)	900	24.0		700	20.7
	1000	23.7		800	20.1
	1100	23.4		900	19.8
	1150	21.0		1000	19.6
	1200	13.2		1100	19.3
				1150	19.3
				1200	19.3

NOTES:
(1) Alloy 625 suffers severe loss of impact strength after longtime aging in the temperature range 1000°F–1400°F.
(2) These stress values may be interpolated to determine values for intermediate temperatures.
(3) Allowable stresses are based on 110,000 psi tensile strength, the minimum strength for annealed material (Grade 1).
(4) Allowable stresses are based on 100,000 psi tensile strength, the minimum strength for solution annealed material (Grade 2).

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Case 161
September 1992

CASES
CODE FOR PRESSURE PIPING — B31

Case 161 Use of Alloy UNS N08926 Material in ASME B31.1 Construction

Inquiry: May UNS N08926 (Nickel–Chromium–Molybdenum–Copper–Nitrogen–Low Carbon Alloy) be used for ASME B31.1 construction?

Reply: UNS N08926 material conforming to ASTM B 366, B 462, B 625, B 649, B 673, B 674, and B 677 may be used for ASME B31.1 construction provided that the following requirements are met.

(a) All applicable requirements of ASME B31.1 shall be met.

(b) This material is not acceptable for use on boiler external piping.

(c) The allowable stress values shown in Table 1 shall apply.

(d) All product forms shall be furnished in the solution annealed condition by the Material Manufacturer. Heat treatment after fabrication and forming is neither required nor prohibited. If heat treatment is performed, the material shall be heated for a sufficient time in the range of 2010°F to 2100°F followed by quenching in water or rapidly cooling by another means.

(e) The metal shall be considered as P-No. 45. Welding electrodes or filler metal shall conform to SFA-5.11 ENiCrMo-3 or ENiCrMo-4; or SFA-5.14 ERNiCrMo-3 or ERNiCrMo-4.

(f) For pipe and tube sizes larger than those listed in B 677 and B 673, the dimensional requirements of B 464 shall be used. The maximum NPS is 30. The maximum wall thickness in any size is 1 in.

(g) Separate Welding Procedure Qualifications and Performance Qualifications shall be conducted in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

Case 161 continues on following page

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CASES
CODE FOR PRESSURE PIPING — B31

TABLE 1
ALLOWABLE STRESS VALUES FOR B 366, B 462, B 625, B 649, B 673, B 674, AND B 677

Spec. No.	Notes	Maximum Allowable Stress, ksi, for Metal Temperatures, °F, not Exceeding								
		−20 to 100	200	300	400	500	600	650	700	750
Seamless Pipe and Tube										
B 677	(2)	23.5	23.5	22.9	21.8	20.8	20.0	19.6	19.3	19.2
B 677	...	23.5	23.5	21.3	19.9	18.7	17.9	17.7	17.6	17.5
Forged Fittings										
B 462	(2)	23.5	23.5	22.9	21.8	20.8	20.0	19.6	19.3	19.2
B 462	...	23.5	23.5	21.3	19.9	18.7	17.9	17.7	17.6	17.5
Welded Pipe and Tube										
B 673, B 674	(1), (2)	20.0	20.0	19.5	18.5	17.7	17.0	16.7	16.4	16.3
B 673, B 674	(1)	20.0	20.0	18.1	16.9	15.9	15.2	15.0	15.0	14.9
Plate, Sheet, and Strip										
B 625	(2)	23.5	23.5	22.9	21.8	20.8	20.0	19.6	19.3	19.2
B 625	...	23.5	23.5	21.3	19.9	18.7	17.9	17.7	17.6	17.5
Bar										
B 649	(2)	23.5	23.5	22.9	21.8	20.8	20.0	19.6	19.3	19.2
B 649	...	23.5	23.5	21.3	19.9	18.7	17.9	17.7	17.6	17.5
Wrought Fittings										
B 366	(2)	23.5	23.5	22.9	21.8	20.8	20.0	19.6	19.3	19.2
B 366	...	23.5	23.5	21.3	19.9	18.7	17.9	17.7	17.6	17.5
Welded Fittings										
B 366	(1), (2)	20.0	20.0	19.5	18.5	17.7	17.0	16.7	16.4	16.3
B 366	(1)	20.0	20.0	18.1	16.9	15.9	15.2	15.0	15.0	14.9

NOTES:
(1) A factor of 0.85 has been applied in arriving at the maximum allowable stress values in tension for this material. Divide tabulated values by 0.85 for maximum allowable longitudinal tensile stress.
(2) Due to relatively low yield strength of these materials, these higher allowable stress values were established at temperatures where the short time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. These stress values exceed 67% but do not exceed 90% of the yield strength at temperature. Use of these stress values may result in dimensional changes due to permanent strain. These values should not be used for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction.

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Case 162
September 1992

CASES
CODE FOR PRESSURE PIPING — B31

Case 162 Use of 21Cr–11Ni–N Alloy (S30815) for ASME B31.1 Construction

Inquiry: May solution annealed 21Cr–11Ni–N Alloy (S30815) seamless tubes and pipes, welded tubes and pipes, plate, sheet, strip, forging, and bar, conforming to the specifications of A 213, A 312, A 249, A 358, A 409, A 240, A 182, and A 479 be used in ASME B31.1 construction?

Reply: It is the opinion of the Committee that solution annealed 21Cr–11Ni–N Alloy (UNS S30815) seamless tubes and pipes, welded tubes and pipes, plate, sheet, strip, forging, and bar as described in the Inquiry may be used in ASME B31.1 construction provided:

(a) the material meets the chemical analysis and minimum tensile requirements detailed in the specification and noted here in Tables 1 and 2, respectively; otherwise conforming to all other requirements of the respective ASTM material specification;

(b) the maximum allowable design stress values shall be as given in Table 3, except that for welded tube and pipe, a joint efficiency factor, E_j, of 0.85 shall be used;

(c) welding shall be performed using any welding process or combination of processes capable of meeting the requirements of Section IX for P-No. 8, Group No. 2 materials. If postweld heat treatment is performed, the material shall be heated to 1560–1740°F for 10–15 minutes, followed by cooling in air.

(d) heat treatment after forming is neither required nor prohibited. If heat treatment is used, the solution treatment shall consist of heating to a temperature of 1920°F to 2100°F and quenching in water or rapidly cooling by other means.

(e) this Case number shall be referenced in the documentation and marking of the material and recorded on the Manufacturer's Data Report.

Case 162 continues on following page

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CASES
CODE FOR PRESSURE PIPING – B31

TABLE 1
CHEMICAL REQUIREMENTS

Element	Percent
Carbon	0.05–0.10
Manganese, max	0.80
Phosphorus, max	0.40
Sulphur, max	0.030
Silicon	1.40–2.00
Nickel	10.0–12.0
Chromium	20.0–22.0
Nitrogen	0.14–0.20
Cerium	0.03–0.08
(Balance Iron)	

TABLE 2
MECHANICAL PROPERTY REQUIREMENTS

Tensile strength, min, ksi	87
Yield strength, 0.2% offset min, ksi	45
Elongation in 2 in. min, %	40

TABLE 3

For Metal Temperature Not Exceeding, °F	Max. Allowable Stress Values, ksi		For Metal Temperature Not Exceeding, °F	Max. Allowable Stress Values, ksi	
	...	Note (1)		...	Note (1)
100	21.8	21.8	1050	11.6	11.6
200	21.6	21.6	1100	9.0	9.0
300	20.4	20.4	1150	6.9	6.9
400	19.6	19.6	1200	5.2	5.2
500	18.4	19.1	1250	4.0	4.0
600	17.7	18.7	1300	3.1	3.1
650	17.5	18.6	1350	2.4	2.4
700	17.3	18.4	1400	1.9	1.9
750	17.1	18.2	1450	1.6	1.6
800	16.8	18.0	1500	1.3	1.3
850	16.6	17.8	1550	1.0	1.0
900	16.3	17.5	1600	0.86	0.86
950	16.1	17.2	1650	0.71	0.71
1000	14.9	14.9			

NOTE:
(1) Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. These higher stress values exceed 67%, but do not exceed 90% of the yield strength at temperature. Use of these stress values may result in dimensional changes due to permanent strain. These stress values are not recommended for flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction.

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ASME B31.1

Interpretations No. 20

Cases No. 15

Date of Issuance: October 31, 1992

This update contains Interpretations No. 20 and Cases No. 15.

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ASME B31.1
INTERPRETATIONS NO. 20

Replies to Technical Inquiries
July 1, 1991, Through December 31, 1991

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service to the Code. The interpretations have been assigned numbers in chronological order. Each interpretation applies either to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. **These interpretations are not a part of the Code or the Addenda.**

These replies are taken verbatim from the original letters, except for a few typographical and editorial corrections made for the purpose of improved clarity. In some instances, a review of the interpretation revealed a need for corrections of a technical nature. In these cases, a revised reply bearing the original interpretation number with the suffix R is presented. In the case where an interpretation is corrected by Errata, the original interpretation number with the suffix E is used.

ASME procedures provide for reconsideration of these interpretations when or if additional information is available which the inquirer believes might affect the interpretation. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME committee or subcommittee. As stated in the Statement of Policy in the Code documents, ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

The interpretations will be issued twice a year up to the publication of the 1995 Edition. Interpretations Nos. 2 through 7 were included with the update service to the 1983 Edition and Interpretations Nos. 8 through 13 were included with the update service to the 1986 Edition. Interpretations Nos. 14 through 19 were included with the update service to the 1989 Edition. Interpretations 20 through 25 will be included with the update service to the 1992 Edition.

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B31.1

Subject	Interpretation	File No.
100.1.2, Power Piping Systems	20-10	B31-91-036
102.2.4, Sootblower Piping System	20-15	B31-91-029
102.3.2, Temperature Fatigue Cycles	20-6	B31-91-001
102.4.3, Weld Joint Efficiency Factors	20-11	B31-91-037
104.1.2, Thickness Allowance for Threads	20-1	B31-89-037
104.8, Stress Due to Sustained Loads	20-12	B31-90-003
115, Use of Flared, Flareless, and Compression Type Tube Fittings	20-14	B31-91-025
122.3.2, Instrument Connections	20-4	B31-91-022
122.8.2(B), Nominal Pipe Size	20-9	B31-91-011
127.4.11(B), Repairs to Base Materials	20-13	B31-91-023
132, NDE prior to PWHT	20-3	B31-91-017
Hot Tapping	20-7	B31-90-023
Scope of Application	20-16	B31-91-035
Table 132, PWHT of P-No. 5 Socket Welds	20-8	B31-90-63R
Use of Cast Iron Valves in Fuel Gas, Caustic and Acid Service	20-5	B31-90-005
Valving for Feedwater Piping in Heat Recovery Steam Generators	20-2	B31-89-038

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Interpretation: 20-1

Subject: B31.1, 104.1.2, Thickness Allowance for Threads

Date Issued: July 17, 1991

File: B31-89-037

Question: In Para. 104.1.2(a), under subparagraph (4) of nomenclature for t_m, does the phrase "forming or machining for jointing" include threading of pipe (and other component) ends as are commonly used to join components together?

Reply: No.

Interpretation: 20-2

Subject: B31.1, Valving for Feedwater Piping in Heat Recovery Steam Generators

Date Issued: July 17, 1991

File: B31-89-038

Question (1): A 3-pressure heat recovery steam generator (HRSG) has three evaporators (HP, IP, LP), each fed by a common supply which has passed through an economizer. Each evaporator has its own feedwater regulating station. Some installations have an LP feedwater supply through the economizer and so the HP and IP evaporators each need a feedwater pump as well. Assuming the economizer and each evaporator has its own Manufacturer's Data Report so that all interconnecting piping is BEP, what is the required feedwater valving and where is (are) the BEP terminal(s) if there is only one HRSG per feedwater source?

Reply (1): Each evaporator and the economizer are treated as separate boilers with respect to their inlet feedwater valving. Each evaporator shall have an inlet stop valve, check valve, and regulating valve. The economizer shall also have an inlet stop valve and check valve. It may also be equipped with an outlet stop valve. In the case of multiple HRSG's, the inlet to the economizer shall have a regulating valve, unless the regulating function is performed by the valves installed at the inlets to each evaporator. The BEP terminals in each case are the inlet to the first valve on the economizer inlet string and the joints where the piping interfaces with the economizer and evaporator headers.

Question (2): Assuming the economizer and each evaporator are supplied under the same Manufacturer's Data Report so that all interconnecting piping is boiler proper, what is the required feedwater valving and where is (are) the BEP terminals if there is only one HRSG per feedwater source? If there are multiple HRSG's for a common feedwater source?

Reply (2): Each evaporator shall have an inlet stop valve, check valve, and regulating valve. The economizer shall also have an inlet stop valve and check valve. Since all inter-connecting piping is boiler proper, there need be no discharge stop valve on the economizer. In the case of multiple HRSG's, the inlet to the economizer shall have a regulating valve, unless the regulating function is performed by the valves installed at the inlets to each evaporator. The BEP terminals are the inlet to the first valve in the economizer inlet string, and the inlet piping interface with the economizer inlet header.

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Interpretation: 20-3

Subject: B31.1, 132, NDE prior to PWHT

Date Issued: July 17, 1991

File: B31-91-017

Question: Does B31.1 require that NDE be performed on welds after they have been subjected to the postweld heat treatment required by Para. 132?

Reply: No.

Interpretation: 20-4

Subject: B31.1, 122.3.2, Instrument Connections

Date Issued: July 17, 1991

File: B31-91-022

Question (1): Does B31.1-1989 Edition, Para. 122.3.2(A.1) require instrument piping take-off connections to be not less than NPS ¾ for service conditions in excess of either 900 psi or 800°F?

Reply (1): Yes.

Question (2): Does Para. 122.3.2(A.1) also apply to tapping on the periphery of orifice plate flanges?

Reply (2): Yes.

Interpretation: 20-5

Subject: B31.1, Use of Cast Iron Valves in Fuel Gas, Caustic and Acid Service

Date Issued: July 18, 1991

File: B31-90-005

Question (1): For the purpose of material selection of a plug valve that meets the requirements of Para. 107 of B31.1, is the plug considered a pressure retaining part?

Reply (1): No.

Question (2): Does B31.1 allow the use of cast iron bodied valves and fittings, with or without corrosion-resistant linings, for acid and caustic service?

Reply (2): Yes, unless the chemical concentration in the system fluid is so high that it is considered to be toxic. See Para. 122.8.2.

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Interpretation: 20-6

Subject: B31.1, 102.3.2, Temperature Fatigue Cycles

Date Issued: July 18, 1991

File: B31-91-001

Question: Does the *f* factor in Para. 102.3.2 apply to determining allowable stresses for a dynamic variation (vibration) superimposed on a sustained stress not exceeding the allowable?

Reply: No. Paragraph 101.5.4 addresses this subject.

Interpretation: 20-7

Subject: B31.1, Hot Tapping

Date Issued: October 2, 1991

File: B31-90-023

Question: What rules apply to hot tapping of piping constructed to the rules of B31.1?

Reply: The hot tapping operation is not specifically addressed by the Code. However, all requirements that are applicable to branch connections (design, materials, fabrication, examination, and construction) and the resulting system loads also apply. If specially designed components are used, Para. 104.7.2 also applies. The conditions under which the hot tap is made (i.e., welding on material containing fluid) shall also be considered with regard to how they affect the welding process and the resulting material properties.

Interpretation: 20-8

Subject: B31.1, Table 132, PWHT of P-No. 5 Socket Welds

Date Issued: October 2, 1991

File: B31-90-63R

Question: Does the term "maximum material thickness of ½ in." as used in Table 132, P-No. 5, Note (1)(a)(2) apply to the thicker of the materials being joined at the weld?

Reply: Yes.

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Interpretation: 20-9

Subject: B31.1, 122.8.2(B), Nominal Pipe Size

Date Issued: October 2, 1991

File: B31-91-011

Question: Paragraph 122.8.2(B) states: ". . . sizes 2½ in. and larger and extra strong in sizes 2 in. and smaller." Are these sizes NPS 2½ and NPS 2, respectively?

Reply: Yes.

Interpretation: 20-10

Subject: B31.1, 100.1.2, Power Piping Systems

Date Issued: October 2, 1991

File: B31-91-036

Question: Within a plant property line, may B31.1 jurisdiction begin at a second plant-installed meter downstream of the gas company's meter?

Reply: No, B31.1 jurisdiction begins at the outlet of the gas company's metering station.

Interpretation: 20-11

Subject: B31.1, 102.4.3, Weld Joint Efficiency Factors

Date Issued: October 2, 1991

File: B31-91-037

Question: May electric resistance welded (ERW) tubular products produced under SA, ASTM, or API specifications be used with a joint efficiency factor of 100% if additional requirements are met per Table 102.4.3 of B31.1?

Reply: No.

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Interpretation: 20-12

Subject: B31.1, 104.8, Stress Due to Sustained Loads

Date Issued: November 7, 1991

File: B31-90-003

Question: Does the B31.1, Para. 102.3.2(D) provide rules to evaluate the displacment effects of a support element (a pinned brace, for example) that loads a piping system similar to a one-time anchor settlement?

Reply: No, but the B31.1 does offer some guidance in the Introduction. "When no Section of the ASME Code for Pressure Piping, specifically covers a piping system, at his discretion the user may select any Section determined to be generally applicable. However, it is cautioned that supplementary requirements to the Section chosen may be necessary to provide for a safe piping system for the intended application. Technical limitations of the various Sections, legal requirements, and possible applicability of other codes or standards are some of the factors to be considered by the user in determining the applicability of any Section of this Code."

Interpretation: 20-13

Subject: B31.1, 127.4.11(B), Repairs to Base Materials

Date Issued: November 7, 1991

File: B31-91-023

Question (1): Is weld metal which is deposited on the inside diameter of a piece of pipe or fitting solely for the purpose of being able to machine a controlled counterbore dimension considered a repair to base material? The weld metal which is deposited does not become part of the minimum wall after machining.

Reply (1): No.

Question (2): If the weld metal deposited above in question (1) is to be used for both machining of a controlled counterbore dimension and for minimum wall thickness after machining, is it to be considered a base metal repair.

Reply (2): Yes.

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Interpretation: 20-14

Subject: B31.1, 115, Use of Flared, Flareless, and Compression Type Tube Fittings.

Date Issued: November 7, 1991

File: B31-91-025

Question: Is it acceptable to use flared, flareless, and compression type tubing fittings not listed in Table 126.1 provided the requirements of Para. 115 are met?

Reply: Yes. See also Para. 123.2.1

Interpretation: 20-15

Subject: B31.1, Paragraph 102.2.4, Sootblower Piping System

Date Issued: November 7, 1991

File: B31-91-029

Question: Are the calculated stresses in a sootblower piping system due to occasional transient operating conditions (such as conditions during operation of a safety valve) permitted to exceed the maximum allowable stress from Appendix A by the amounts permitted in Paras. 102.2.4(A) and (B)?

Reply: Yes; also see Para. 104.8.2

Interpretation: 20-16

Subject: B31.1, Scope of Application

Date Issued: November 7, 1991

File: B31-91-035

Question: Does ASME B31.1 apply to piping systems within fuel cell electric generating plants?

Reply: Yes.

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B31.1 — Cases No. 15

The Cases are not part of ASME B31.1-1992 Edition or its Addenda

A Case is the official method of handling a reply to an inquiry when study indicates that the Code wording needs clarification, or when the reply modifies the existing requirements of the Code, or grants permission to use new materials or alternative constructions.

ASME has agreed to publish Cases issued by the B31 Committee concerning B31.1 as part of the update service to B31.1. The text of proposed new and revised Cases and reaffirmations of current Cases appear in *Mechanical Engineering* for public review. A notice also appears in *Mechanical Engineering* when new and revised Cases are approved. New and revised Cases, as well as announcements of reaffirmed Cases and annulments, then appear in the next update. All Cases currently in effect at the time of publication of the 1989 Edition of the Code were included in the update that immediately followed, Interpretations No. 14 and Cases No. 9. Subsequently, all Cases currently in effect at the time of publication of a new Edition are to be included with it as an update.

Cases No. 14, which was the update included with the 1992 Edition, contains the following Cases.

136-1	153
145	154
147	155
148	156
149	157
151	158

Cases 139, 143, 144, 146-1, and 150, which were included in updates to the 1989 Edition, were allowed to expire.

The page numbers for the Cases supplements included with updates to the 1992 Edition start with C-1 and continue consecutively through the last update to this Edition. The Cases affected by this supplement are as follows:

Page	*Location*	*Change*
C-27	Case 159	Added
C-29	Case 160	Added

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This Case shall expire on August 31, 1995, unless previously annulled or reaffirmed

CASE 159
August 1992

CASES
CODE FOR PRESSURE PIPING—B31

Case 159 Use of Copper in B31.1 Construction

Inquiry: What additional rules apply to the use of copper and copper alloy instrumentation and control tubing conducting fuel gas for use on systems which are designed in accordance with the rules of ASME B31.1?

Reply: Materials listed in Table A-6 of ASME B31.1 may be used for instrumentation and control tubing conducting fuel gas, provided that the following additional requirements are met.

(a) The design pressure shall not exceed 100 psig.

(b) Only tubing which is ½ in. outside diameter or smaller may be used.

(c) All joints shall be made using flared fittings. The use of brazed, screwed, or compression fittings is not permitted.

(d) Copper tubing shall not be used if the fuel gas contains more than 0.3 grains of hydrogen sulfide per 100 SCFM of gas.

(e) Consideration shall be given in the design to the lower strength and melting point of copper and copper alloys as compared to steel. Adequate support and protection from high ambient temperatures and vibration shall be provided.

(f) Tubing shall be installed in a guarded manner that will prevent damage during construction, operation, and service.

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CASE 160
August 1992

CASES
CODE FOR PRESSURE PIPING—B31

Case 160 Exemptions from PWHT For Nonload Carrying Attachments in B31.1 Construction

Inquiry: When attaching nonload carrying studs to pressure containing materials, what additional exemptions to mandatory PWHT may be taken in addition to the exemptions available in Table 132?

Reply: For P-Nos. 4 and 5 materials meeting all of the following conditions, PWHT may be exempted:

(a) a maximum specified chromium content of 3.0% on the pressure containing material;

(b) a maximum specified or actual carbon content of 0.15% on the pressure containing material;

(c) a minimum preheat of 300°F;

(d) stud welds or fillet welds made by the SMAW or GTAW process shall be used;

(e) the hardened portion of the heat affected zone (HAZ) shall not encroach on the minimum wall thickness of the pipe, as determined by welding procedure qualification using the maximum welding heat input; the depth of the HAZ shall be taken as the point where the HAZ hardness does not exceed the average unaffected base metal hardness by more than 10%; and

(f) if SMAW is used, the electrode shall be the low hydrogen type.

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ASME B31.1

INTERPRETATIONS NO. 19

Replies to Technical Inquiries
January 1, 1991, Through June 30, 1991

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service to the Code. The interpretations have been assigned numbers in chronological order. Each interpretation applies either to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. **These interpretations are not a part of the Code or the Addenda.**

These replies are taken verbatim from the original letters, except for a few typographical and editorial corrections made for the purpose of improved clarity. In some instances, a review of the interpretation revealed a need for corrections of a technical nature. In these cases, a revised reply bearing the original interpretation number with the suffix R is presented. In the case where an interpretation is corrected by Errata, the original interpretation number with the suffix E is used.

ASME procedures provide for reconsideration of these interpretations when or if additional information is available which the inquirer believes might affect the interpretation. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME committee or subcommittee. As stated in the Statement of Policy in the Code documents, ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

The interpretations will be issued twice a year up to the publication of the 1992 Edition. Interpretations Nos. 2 through 7 were included with the update service to the 1983 Edition and Interpretations Nos. 8 through 13 were included with the update service to the 1986 Edition. Interpretations Nos. 14 through 19 will be included with the update service to the 1989 Edition.

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B31.1

Subject	Interpretation	File No.
100.1.3(I), Referenced Standards for Building Services Piping	19-2	B31-90-032
122.1.7(A.2), Use of Butterfly Valves	19-3	B31-90-064
122.2(A.1), Design Pressure for Blowoff Piping	19-1	B31-90-019
124.6(B), Welding of Ductile Iron	19-4	B31-90-065
127.3.3(A), Gap Requirements for Socket Welds	19-5	B31-91-002
1986 Edition With 1988 Addenda, 127.3.1(A) and (C), Gap Between Backing Ring and Pipe	19-6	B31-90-061
Table 132, PWHT of Socket Welds	19-7	B31-90-062, B31-90-063

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Interpretation: 19-1

Subject: B31.1, 122.2(A.1), Design Pressure for Blowoff Piping

Date Issued: April 5, 1991

File: B31-90-019

Question: For blowoff piping described in Para. 122.2(A.1) and boiler pressures of 250 psig or below, is it permissible to use a value of P which is less than the lowest set pressure of any safety valve on the boiler drum?

Reply: No. See Table 122.2, Note (1) and Para. 122.1.4(B.1).

Interpretation: 19-2

Subject: B31.1, 100.1.3(I), Referenced Standards for Building Services Piping

Date Issued: April 5, 1991

File: B31-90-032

Question: Paragraph 100.1.3(I) refers to B31.9 as being applicable to the described building services piping. When B31.9 references another standard as being applicable to certain categories of building services piping, is it permissible to use that referenced standard instead of reverting back to B31.1 as described in Para. 100.1.3(I)?

Reply: Yes.

Interpretation: 19-3

Subject: B31.1, 122.1.7(A.2), Use of Butterfly Valves

Date Issued: April 5, 1991

File: B31-90-064

Question: Is it permissible to substitute a butterfly valve with worm gear operator for the outside-screw-and-yoke type valve called for in Para. 122.1.7(A.2)?

Reply: No.

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Interpretation: 19-4

Subject: B31.1, 124.6(B), Welding of Ductile Iron

Date Issued: April 5, 1991

File: B31-90-065

Question: Does Para. 124.6(B) prohibit a seal weld from being used when a carbon steel pipe nipple is threaded into a tapped ductile iron fitting although all other rules pertaining to seal welds and threaded connections are followed?

Reply: Yes.

Interpretation: 19-5

Subject: B31.1, 127.3.3(A), Gap Requirements for Socket Welds

Date Issued: April 5, 1991

File: B31-91-002

Question (1): Does Para. 127.3.3(A) require that the approximately $\frac{1}{16}$ in. gap required during fitup exist after welding is completed?

Reply (1): No.

Question (2): Does ASME B31.1 require an examination, radiographic or otherwise, to verify that the fitup gap required by Para. 127.3.3(A) exists in the completed weld?

Reply (2): No.

Interpretation: 19-6

Subject: B31.1, 1986 Edition With 1988 Addenda, 127.3.1(A) and (C), Gap Between Backing Ring and Pipe

Date Issued: April 11, 1991

File: B31-90-061

Question: Does ASME B31.1-1986 Edition with 1988 Addenda contain rules for limiting the gap between a backing ring and the inside diameter of the pipe?

Reply: No.

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Interpretation: 19-7

Subject: B31.1, Table 132, PWHT of Socket Welds

Date Issued: April 11, 1991

File: B31-90-062, B31-90-063

Question: Paragraph 132.4 defines the *nominal thickness* which governs postweld heat treatment for use with Table 132. Table 132 has requirements for nominal thickness for P-Nos. 1 and 3 materials; however, for P-No. 5 materials, the term *thickness* is used in the Notes. Does Para. 132.4 apply in the determination of this thickness?

Reply: No.

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ASME B31.1

Interpretations No. 18

This update contains Interpretations No. 18, but no cases.

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ASME B31.1

INTERPRETATIONS NO. 18

Replies to Technical Inquiries
July 1, 1990, Through December 31, 1990

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service to the Code. The interpretations have been assigned numbers in chronological order. Each interpretation applies either to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. **These interpretations are not a part of the Code or the Addenda.**

These replies are taken verbatim from the original letters, except for a few typographical and editorial corrections made for the purpose of improved clarity. In some instances, a review of the interpretation revealed a need for corrections of a technical nature. In these cases, a revised reply bearing the original interpretation number with the suffix R is presented. In the case where an interpretation is corrected by Errata, the original interpretation number with the suffix E is used.

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B31.1

Subject	Interpretation	File No.
119.7 and Appendix D; Flexibility Analysis for Lateral Connections	18-6	B31-90-25B
119.10.1, Cold Spring	18-5	B31-90-024
124.1, Design for Low Temperature Operation	18-7	B31-90-036
Expected Service Life	18-1	B31-89-026
Fig. 127.4.8(E), Tolerance on Root Gap	18-2	B31-89-039
Operational Limits	18-3	B31-88-11B
Thickness of Branch Connections	18-4	B31-90-018

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Interpretation: 18-1

Subject: B31.1, Expected Service Life

Date Issued: August 29, 1990

File: B31-89-026

Question: Do the guidelines by which the allowable stresses are assigned for materials to be used in B31.1 construction imply a specified design life for B31.1 components?

Reply: No. As described in the Introduction to B31.1, "The Code sets forth engineering requirements...for safe design and construction of pressure piping. While safety is the basic concern, this factor alone will not necessarily govern the final specifications for any piping system." It is the responsibility of the designer to use competent engineering judgment in determining other pertinent factors in his final specifications, such as establishing a recommended service life for a particular piping system.

Interpretation: 18-2

Subject: B31.1, Fig. 127.4.8(E), Tolerance on Root Gap

Date Issued: August 29, 1990

File: B31-89-039

Question: Does ANSI/ASME B31.1-1986 Edition permit a tolerance on the measurement and maintenance of the $\frac{1}{16}$ in. root gap for welded branch connections shown in Fig. 127.4.8(E)?

Reply: Yes.

Interpretation: 18-3

Subject: B31.1, Operational Limits

Date Issued: December 28, 1990

File: B31-88-11B

Question: Does ASME B31.1 allow for operation of piping at any coincident condition of pressure and temperature that produces a stress greater than 120% of the allowable stress at the coincident temperature?

Reply: No.

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Interpretation: 18-4

Subject: B31.1, Thickness of Branch Connections

Date Issued: December 28, 1990

File: B31-90-018

Question: Is the limit for the altitude of reinforcement L_4, based on the header wall thickness wherein the branch and header are almost equal and/or the thickness of the branch pipe is relatively small with regard to the header thickness? Refer to Para. 104.3.1(D.2) of ASME B31.1.

Reply: Yes. The current requirement of basing the altitude of the reinforcement zone on a function of the thickness of the header or branch, whichever is less, is commensurate with other ASME piping and pressure vessel codes.

Interpretation: 18-5

Subject: B31.1, 119.10.1, Cold Spring

Date Issued: December 28, 1990

File: B31-90-024

Question: When calculating minimum or maximum acceptable hot reactions for a power piping system and taking credit for cold spring, does 119.10.1 of ASME B31.1 limit the cold spring credit the piping system designer can take to no more than two-thirds of the cold spring that will be provided in the construction of the piping system?

Reply: Yes.

Interpretation: 18-6

Subject: B31.1, 119.7 and Appendix D; Flexibility Analysis for Lateral Connections

Date Issued: December 28, 1990

File: B31-90-25B

Question: Is it permissible to use the *k*- and *i*-factors from Table D-1, meant for a variety of 90 deg. branch connections, for lateral connections (angular branch connections with or without added reinforcement)?

Reply: Appendix D of ASME B31.1 provides some *k*- and *i*-factors for certain types of piping components and configurations. When performing a flexibility analysis in accordance with Para. 119.7, it is the responsibility of the designer to determine if the factors given in Appendix D may be used, or if a comprehensive calculation is required. See Para. 119.7.3, third paragraph.

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Interpretation: 18-7

Subject: B31.1, 124.1, Design for Low Temperature Operation

Date Issued: December 28, 1990

File: B31-90-036

Question: What stresses shall be used for temperatures below the lowest temperature listed in Appendix A of ASME B31.1?

Reply: ASME B31.1 does not contain rules for design of piping systems intended for operation at temperatures below those listed in the Stress Tables. In such cases, the Code user should be guided by the tenth paragraph of the Introduction and the third paragraph of the Foreword to B31.1, which address piping systems not specifically covered.

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B31.1 — Cases No. 13

(The Cases are not part of ASME B31.1-1989 Edition or its Addenda.)

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The page numbers for the Cases supplements included with updates to the 1989 Edition start with C-1 and continue consecutively through this Cases supplement, which is the last one to this Edition. The Cases affected by this supplement are as follows:

Page	*Location*	*Change*
C-1	Case 136-1	(1) Reaffirmed: April 30, 1991 (2) New expiration date: April 30, 1994
C-9	Case 145	(1) Reaffirmed: July 31, 1991 (2) New expiration date: July 31, 1994
C-17	Case 148	(1) Reaffirmed: April 30, 1991 (2) New expiration date: April 30, 1994
C-19	Case 149	(1) Reaffirmed: November 30, 1991 (2) New expiration date: November 30, 1994
C-23	Case 151	Subparagraph (h) corrected by Errata

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This case shall expire on May 31, 1992, unless previously annulled or reaffirmed

CASE 151
May 1989

CASES
CODE FOR PRESSURE PIPING — B31

Case 151 Use of Alloy UNS N08925 Material in ASME B31.1 Construction

Inquiry. May UNS N08925 (Nickel–Chromium–Molybdenum–Copper) stainless steel material be used for ASME B31.1 construction?

Reply. UNS N08925 material conforming to ASTM B 625-83, B 649-83, B 673-83 and B 677-84 may be used for ASME B31.1 construction provided that the following requirements are met.

(a) All applicable requirements of ASME B31.1 shall be met.

(b) THIS MATERIAL IS NOT ACCEPTABLE FOR USE ON BOILER EXTERNAL PIPING.

(c) The allowable stress values shown in Tables 1, 2, and 3 shall apply.

(d) Wrought fittings shall conform to all applicable requirements of ASTM B 366, Class WP.

(e) Forged flanges and fittings shall conform to all applicable requirements of ASTM B 462.

(f) All product forms shall be furnished in the solution annealed condition by the Material Manufacturer. The as-supplied material shall meet the the mechanical properties of the material specification from which the product form was manufactured. Heat treatment after fabrication or forming is neither required nor prohibited. If heat treatment is used, the solution heat treatment shall consist of heating to a temperature of 2010°F to 2100°F followed by quenching in water or rapidly cooling by other means.

(g) Separate Welding Procedure Qualifications and Performance Qualifications shall be conducted in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

(h) Welding electrodes or filler metals shall conform to one of the following:

SFA 5.11 ENiCrMo-3 or ENiCrMo-4
SFA 5.14 ERNiCrMo-3 or ERNiCrMo-4

Case 151 continues on following page

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CASES
CODE FOR PRESSURE PIPING — B31

TABLE 1

For Metal Temperature Not Exceeding, °F	Allowable Stress Values, ksi, for Fittings, Flanges and Seamless Pipe
−20 to 100	21.7
200	21.7
300	20.9
400	19.6
500	18.3
600	17.3
650	16.9
700	16.9
750	16.9
800	16.9

TABLE 2

For Metal Temperature Not Exceeding, °F	Allowable Stress Values, ksi, for Welded Pipe Without Filler Metal Added [Notes (1), (2)]
−20 to 100	18.4
200	18.4
300	17.8
400	16.7
500	15.6
600	14.7
650	14.4
700	14.4
750	14.4
800	14.4

NOTES:
(1) The allowable stress values for welded pipe without filler metal added include a Weld Joint Efficiency Factor E of 0.85.
(2) The allowable stress values given in Table 1 may be used for welded pipe with 100% radiography per Para. 136.4.5.

Case 151 continues on following page

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ASME B31.1

INTERPRETATIONS NO. 17

Replies to Technical Inquiries
January 1, 1990, Through June 30, 1990

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These replies are taken verbatim from the original letters, except for a few typographical and editorial corrections made for the purpose of improved clarity. In some instances, a review of the interpretation revealed a need for corrections of a technical nature. In these cases, a revised reply bearing the original interpretation number with the suffix R is presented. In the case where an interpretation is corrected by Errata, the original interpretation number with the suffix E is used.

ASME procedures provide for reconsideration of these interpretations when or if additional information is available which the inquirer believes might affect the interpretation. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME committee or subcommittee. As stated in the Statement of Policy in the Code documents, ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

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B31.1

Subject	Interpretation	File No.
100.1, Scope of Application	17-3	B31-88-005
121.3, Use of Carbon Steel for Support Elements in Compression	17-1	B31-88-019
127.5.3(A.3), Qualification of Welders	17-5	B31-89-041
136.4, Permissible Additional NDE	17-4	B31-88-020
Scope of Application for Hot Water Distribution Systems	17-2	B31-88-025
Table 102.4.3, Welded Joint Efficiency Factors	17-6	B31-89-025

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Interpretation: 17-1

Subject: B31.1, 121.3, Use of Carbon Steel for Support Elements in Compression

Date Issued: February 27, 1990

File: B31-88-019

Question: May pipe supporting elements of carbon steel materials with allowable stress values listed in Appendix A of ASME B31.1 be used in designs for compressive loading at temperatures in excess of those temperatures for which allowable stress values are listed?

Reply: No.

Interpretation: 17-2

Subject: B31.1, Scope of Application for Hot Water Distribution Systems

Date Issued: February 27, 1990

File: B31-88-025

Question (1): Does ASME B31.1 apply only to piping from ASME Section I power boilers (greater than 15 psig for steam) and hot water boilers (greater than 160 psig and/or in excess of 250°F)?

Reply (1): No.

Question (2): Does ASME B31.1 apply to nonboiler external piping of central and district heating systems utilizing ASME Section IV hot water heating boilers (less than 160 psig and/or less than 250°F)?

Reply (2): Yes, if the systems are designated for greater than 30 psig. See Para. 100.1.3(C).

Question (3): Does ASME B31.1, Para. 100.1.3(C) require that hot water heating systems designated for greater than 30 psig come under the scope of B31.1?

Reply (3): B31.1 may be the applicable code for hot water heating systems designated for greater than 30 psig. See also Para. 100.1.3(I).

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ASME B31.1 89 ■ 0759670 0503409 3 ■

Interpretation: 17-3

Subject: B31.1, 100.1, Scope of Application

Date Issued: March 12, 1990

File: B31-88-005

Question (1): As used in B31.1, Para. 100.1.1 (first paragraph), what are the definitions of auxiliary service piping, industrial and institutional plants, and central heating plants?

Reply (1): As used in B31.1, Para. 100.1.1 (first paragraph), auxiliary service piping is that piping contained in systems which support the main or primary piping systems in the identified plants. Examples of auxiliary service piping include but are not limited to water, oil, gas, and air. Industrial and institutional plants and central heating plants are examples of facilities which may contain power piping and auxiliary service piping. Paragraph 100.1.3 defines the only explicit exclusions from the Code.

Question (2): Are the terms industrial and institutional buildings in Para. 100.1.3(J) synonymous with the terms industrial and institutional plants in Para. 100.1.1?

Reply (2): Yes.

Question (3): Are fuel gas and fuel oil piping systems within the plants mentioned in Para. 100.1.1 power piping within the scope of B31.1 when these systems are used to supply fuel to power or heating boilers?

Reply (3): Yes, unless the piping is specifically within the scope of another B31 Code Section, or where fuel gas piping is excluded by Para. 100.1.3(J).

Interpretation: 17-4

Subject: B31.1, 136.4, Permissible Additional NDE

Date Issued: March 12, 1990

File: B31-88-020

Question: For welds that require only visual examination in accordance with Table 136.4, where the inside surface is not readily accessible, may radiographic inspection be performed and interpreted per the acceptance standards of Para. 136.4.2?

Reply: A visual examination is required for the accessible surface of the weld. The acceptance criteria for examinations that are not required by the Code are not in the scope of the Code. The acceptance criteria for these additional examinations should be based on an engineering evaluation.

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ASME B31.1 89 ■ 0759670 0503410 T ■

Interpretation: 17-5

Subject: B31.1, 127.5.3(A.3), Qualification of Welders

Date Issued: April 9, 1990

File: B31-89-041

Question: A fabricator and an owner have agreed to use a WPS (with a PQR) of a technically competent organization. The fabricator's welder has already qualified in accordance with ASME Section IX using a fabricator's WPS. This welder performance qualification would meet the requirements for performance qualification on the WPS of the technically competent organization. Is it required that a fabricator's welder qualify using the WPS of the technically competent organization in order for the WPS to be used?

Reply: Yes, see Paras. 127.5.3(A) and (A.3).

Interpretation: 17-6

Subject: B31.1, Table 102.4.3, Welded Joint Efficiency Factors

Date Issued: May 7, 1990

File: B31-89-025

Question: May ASTM A 312 welded pipe, having a weld joint efficiency factor *E* of 0.85 as listed in Table 3 of Appendix A, which has been examined by 100% radiography according to ASME B31.1 requirements (1986 Edition, including 1988 Addenda) qualify for a weld joint efficiency factor *E* of 1.00 per Table 102.4.3?

Reply: Yes.

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B31.1 — Cases No. 12

(The Cases are not part of ASME B31.1-1989 Edition or its Addenda.)

A Case is the official method of handling a reply to an inquiry when study indicates that the Code wording needs clarification, or when the reply modifies the existing requirements of the Code, or grants permission to use new materials or alternative constructions.

ASME has agreed to publish Cases issued by the B31 Committee concerning B31.1 as part of the update service to B31.1. The text of proposed new and revised Cases and reaffirmations of current Cases appear in *Mechanical Engineering* for public review. A notice also appears in *Mechanical Engineering* when new and revised Cases are approved. New and revised Cases, as well as announcements of reaffirmed Cases and annulments, then appear in the next update. All cases currently in effect at the time of publication of the 1989 Edition of the Code were included in the update that immediately followed, Interpretations No. 14 and Cases No. 9.

The page numbers for the Cases supplements included with updates to the 1989 Edition start with C-1 and continue consecutively through the last Cases supplement to this Edition. The Cases added by this supplement are as follows:

Page	*Location*	*Change*
C-15	Case 147	(1) Reaffirmed: August 1990 (2) New expiration date: August 31, 1993
C-33	Case 156	Added
C-35	Case 157	Added
C-37	Case 158	Added

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This case shall expire on August 31, 1993, unless previously annulled or reaffirmed

CASE 156
August 1990

CASES
CODE FOR PRESSURE PIPING—B31

Case 156 Use of Bolts and Studs Conforming to ASTM A 449-87 in B31.1 Construction

Question: May bolts and studs conforming to the requirements of ASTM A 449-87 be used for ASME B31.1 construction?

Reply: It is the opinion of the Committee that bolts and studs meeting the requirements of ASTM A 449-87 may be used for ASME B31.1 construction provided that the following additional requirements are met.

(a) THIS MATERIAL IS NOT ACCEPTABLE FOR USE ON BOILER EXTERNAL PIPING (BEP) [SEE FIGS. 100.1.2(A) AND (B)].

(b) This material shall not be used for services where the design temperatures exceed 650°F.

(c) The allowable stress values used for this material shall not exceed those listed in the Table 1.

TABLE 1

Diameter	Allowable Stress Value [Note (1)]
Less than or equal to 1 in.	23.0 ksi
Greater than 1 in. and less than or equal to 1½ in.	20.0 ksi
Greater than 1½ in. and less than or equal to 3 in.	14.5 ksi

NOTE:
(1) These allowable stress values are established from a consideration of strength only and will be satisfactory for average service. For bolted joints, where freedom from leakage over a long period of time without retightening is required, lower stress values may be necessary as determined from the relative flexibility of the flange and bolts and corresponding relaxation properties.

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CASE 157
September 1990

CASES
CODE FOR PRESSURE PIPING—B31

Case 157 Alternative Rules for Carbon Content in Low Alloy Materials in B1.1 Construction

Question: What alternative rules may be used in lieu of controlling the base material and the weld filler material carbon content of low alloy materials used at temperatures above 850°F in accordance with Para. 124.2(d) and Note (18) of Table A-2?

Reply: Except for 2¼Cr–1Mo materials, the carbon content of base metals and filler metals need not be controlled beyond the material specification. For 2¼Cr–1Mo materials, the as-deposited weld metal shall have a carbon content greater than 0.05%; otherwise, the allowable stress listed in Table A-2 shall be reduced to 80% of the listed value.

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CASE 158
November 1990

CASES
CODE FOR PRESSURE PIPING—B31

Case 158 Alternative Bolting Materials in B31.1 Construction

Inquiry: May bolting materials conforming to ASTM A 193 Grade B7M and ASTM A 320 Grade L7M be used for ASME B31.1 construction?

Reply: ASTM A 193 Grade B7M and ASTM A 320 Grade L7M may be used for ASME B31.1 construction provided that all of the following additional requirements are met.

(a) THESE MATERIALS ARE NOT ACCEPTABLE FOR USE ON BOILER EXTERNAL PIPING. SEE FIGS. 100.1.2(A) and (B).

(b) All applicable requirements of ASME B31.1 shall be met.

(c) The allowable stress values tabulated below shall not be exceeded. These materials shall not be used at design temperatures above those for which allowable stress values are given in this Code Case. These allowable stress values apply to bolting materials 2½ in. in diameter and smaller.

ASTM A 193 Grade B7M and ASTM A 320 Grade L7M

Temperature, °F	Allowable Stress, ksi
−20 to 650	20.0
700	20.0
750	20.0
800	18.5
850	16.2
900	12.5
950	8.5
1000	4.5

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ASME B31.1

Interpretations No. 15

Replies to Technical Inquiries
January 1, 1989, Through June 30, 1989

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service to the Code. The interpretations have been assigned numbers in chronological order. Each interpretation applies to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. **The interpretations are not part of the Code or the Addenda.**

These replies are taken verbatim from the original letters, except for a few typographical and editorial corrections made for the purpose of improved clarity. In some instances, a review of the interpretation revealed a need for corrections of a technical nature. In these cases, a revised reply bearing the original interpretation number with the suffix R is presented. In the case where an interpretation is corrected by Errata, the original interpretation number with the suffix E is used.

ASME procedures provide for reconsideration of these interpretations when or if additional information is available which the inquirer believes might affect the interpretation. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME committee or subcommittee. As stated in the Statement of Policy in the Code documents, ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

The interpretations will be issued twice a year up to the publication of the 1992 Edition. Interpretations Nos. 2 through 7 were included with the update service to the 1983 Edition and Interpretations Nos. 8 through 13 were included with the update service to the 1986 Edition. Interpretations Nos. 14 through 19 will be included with the update service to the 1989 Edition.

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B31.1

Subject	Interpretation	File No.
Hydrostatic Testing of Threaded Boiler External Piping	15-1	B31-86-026
Para. 122.1.7(A), Turbine Throttle Valve in Place of a Stop Valve	15-6	B31-88-027
Para. 122.3, Rules for In-line Sensing Devices	15-7	B31-88-28A
Para. 122.4 (A.1), Desuperheaters With Integral Regulating Mechanisms	15-3	B31-88-013
Para. 122.6.2 (C), Definition of "Blowout of Steam"	15-4	B31-87-019
Use of Materials Not Listed in Appendix A	15-2	B31-88-007
Use of Plastic Pipe for Air Service	15-5	B31-88-024

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Interpretation: 15-1

Subject: B31.1, Hydrostatic Testing of Threaded Boiler External Piping

Date Issued: February 16, 1989

File: B31-86-026

Question: Paragraph 137.3.1 of ANSI/ASME B31.1 references PG-99 of Section I for hydrostatic testing of Boiler External Piping. Does PG-99 require the presence of an Authorized Inspector for hydrostatic tests conducted on Boiler External Piping even when that piping is assembled using only threaded joints?

Reply: Yes. The rules for hydrostatic testing of Boiler External Piping apply regardless of the method of construction used.

Interpretation: 15-2

Subject: B31.1, Use of Materials Not Listed in Appendix A

Date Issued: February 16, 1989

File: B31-88-007

Question: If a material specification is listed in Table 126.1, but a grade of the material is not listed in Appendix A, is it permissible to use the unlisted material in B31.1 construction?

Reply: Yes, provided the use of the unlisted grade is not specifically prohibited by B31.1 [see Para. 102.3.1 (B)] and that allowable stress values for that specific grade listed in Section VIII, Division 1 or Section I are used. If allowable stress values for the unlisted grade are not given in Section VIII, Division 1 or Section I, the use of that material grade is not permitted.

Interpretation: 15-3

Subject: B31.1, Para. 122.4(A.1), Desuperheaters With Integral Regulating Mechanisms

Date Issued: February 16, 1989

File: B31-88-013

Question: What rules of ANSI/ASME B31.1 apply to the use of a probe-type desuperheater with multiple integral nozzles, a position control plug, and integral stop valve?

Reply: ANSI/ASME B31.1 does not have specific rules to cover this application. Paragraph 122.4 covers spray type desuperheater piping, but addresses the design from the basis that all of the components are separate. ANSI/ASME B31.1 does not intentionally place limits on new technological developments that meet basic safety requirements of the Code.

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Interpretation: 15-4

Subject: B31.1, Para. 122.6.2(C), Definition of "Blowout of Steam"

Date Issued: March 21, 1989

File: B31-87-019

Question: What is the definition of the term "Blowout of steam" as used in Para. 122.6.2(C)?

Reply: "Blowout of steam," as utilized in Para. 122.6.2(C), is the reversal of relieving-steam flow (blowback) from the vent line entrance, typically as a result of insufficient flow-area within the vent system.

Interpretation: 15-5

Subject: B31.1, Use of Plastic Pipe for Air Service

Date Issued: March 21, 1989

File: B31-88-024

Question (1): Paragraph 105.3 permits the use of polyvinyl chloride piping and polyethylene piping in air service under specified conditions. Does the Code permit polyvinyl chloride piping in air service at up to 150 psig and 140°F., and polyethylene piping in air service at up to 150 psig and 120 °F.?

Reply (1): No. Specified conditions are those limits which are recommended by the manufacturer for the fluid service involved. The pressure/temperature limits in Para. 105.3 were intended for water service only and are the maximum pressure and temperature permitted regardless of what the manufacturer recommends.

Question (2): Is Appendix III applicable to air service?

Reply (2): No. See Para. III-1.2.2.

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Interpretation: 15-6

Subject: B31.1, Para. 122.1.7(A), Turbine Throttle Valve in Place of a Stop Valve

Date Issued: March 27, 1989

File: B31-88-027

Question: For the case of a single boiler and prime mover installation, does Para. 122.1.7(A) allow the stop valve to be omitted entirely if the prime mover throttle valve is equipped with a position indicator to show whether the valve is open or closed and is designed to withstand the required hydrostatic pressure test of the boiler?

Reply: Yes.

Interpretation: 15-7

Subject: B31.1, Para. 122.3, Rules for In-line Sensing Devices

Date Issued: June 13, 1989

File: B31-88-28A

Question: Does Para. 122.3 of ANSI/ASME B31.1 require that the pressure containing portion of an in-line sensing device be designed, fabricated, examined, and tested in accordance with the rules of B31.1?

Reply: Yes.

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B31.1 — Cases No. 10

(The Cases are not part of ASME B31.1-1989 Edition or its Addenda.)

A Case is the official method of handling a reply to an inquiry when study indicates that the Code wording needs clarification, or when the reply modifies the existing requirements of the Code, or grants permission to use new materials or alternative constructions.

ASME has agreed to publish Cases issued by the B31 Committee concerning B31.1 as part of the update service to B31.1. The text of proposed new and revised Cases and reaffirmations of current Cases appear in *Mechanical Engineering* for public review. A notice also appears in *Mechanical Engineering* when new and revised Cases are approved. New and revised Cases, as well as announcements of reaffirmed Cases and annulments, then appear in the next update. All cases currently in effect at the time of publication of the 1989 Edition of the Code were included in the update that immediately followed, Interpretations No. 14 and Cases No. 9.

The page numbers for the Cases supplements included with updates to the 1989 Edition start with C-1 and continue consecutively through the last Cases supplement to this Edition. The Cases added by this supplement are as follows:

Page	*Location*	*Change*
C-23	Case 151	Added
C-27	Case 153	Added
C-29	Case 154	Added

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CASE 151
May 1989

CASES
CODE FOR PRESSURE PIPING — B31

Case 151 Use of Alloy UNS N08925 Material in ASME B31.1 Construction

Inquiry. May UNS N08925 (Nickel–Chromium–Molybdenum–Copper) stainless steel material be used for ASME B31.1 construction?

Reply. UNS N08925 material conforming to ASTM B 625-83, B 649-83, B 673-83 and B 677-84 may be used for ASME B31.1 construction provided that the following requirements are met.

(a) All applicable requirements of ASME B31.1 shall be met.

(b) THIS MATERIAL IS NOT ACCEPTABLE FOR USE ON BOILER EXTERNAL PIPING.

(c) The allowable stress values shown in Tables 1, 2, and 3 shall apply.

(d) Wrought fittings shall conform to all applicable requirements of ASTM B 366, Class WP.

(e) Forged flanges and fittings shall conform to all applicable requirements of ASTM B 462.

(f) All product forms shall be furnished in the solution annealed condition by the Material Manufacturer. The as-supplied material shall meet the the mechanical properties of the material specification from which the product form was manufactured. Heat treatment after fabrication or forming is neither required nor prohibited. If heat treatment is used, the solution heat treatment shall consist of heating to a temperature of 2010°F to 2100°F followed by quenching in water or rapidly cooling by other means.

(g) Separate Welding Procedure Qualifications and Performance Qualifications shall be conducted in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

(h) Welding electrodes or filler metals shall conform to one of the following:

SFA 5.11 ENiCrMo-3 or ERNiCrMo-4
SFA 5.14 ENiCrMo-3 or ERNiCrMo-4

Case 151 continues on following page

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Case 151
May 1989

CASES
CODE FOR PRESSURE PIPING — B31

TABLE 1

For Metal Temperature Not Exceeding, °F	Allowable Stress Values, ksi, for Fittings, Flanges and Seamless Pipe
−20 to 100	21.7
200	21.7
300	20.9
400	19.6
500	18.3
600	17.3
650	16.9
700	16.9
750	16.9
800	16.9

TABLE 2

For Metal Temperature Not Exceeding, °F	Allowable Stress Values, ksi, for Welded Pipe Without Filler Metal Added [Notes (1), (2)]
−20 to 100	18.4
200	18.4
300	17.8
400	16.7
500	15.6
600	14.7
650	14.4
700	14.4
750	14.4
800	14.4

NOTES:
(1) The allowable stress values for welded pipe without filler metal added include a Weld Joint Efficiency Factor E of 0.85.
(2) The allowable stress values given in Table 1 may be used for welded pipe with 100% radiography per Para. 136.4.5.

Case 151 continues on following page

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Case 151
May 1989

CASES
CODE FOR PRESSURE PIPING — B31

TABLE 3

For Metal Temperature Not Exceeding, °F	Allowable Stress Values, ksi, for Welded Pipe With Filler Metal Added [Notes (1), (2)]
−20 to 100	17.4
200	17.4
300	16.7
400	15.7
500	14.6
600	13.8
650	13.5
700	13.5
750	13.5
800	13.5

NOTES:
(1) The allowable stress values for welded pipe with filler metal added include a Weld Joint Efficiency Factor E of 0.80.
(2) The allowable stress values given in Table 1 may be used for welded pipe with 100% radiography per Para. 136.4.5.

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CASE 153
November 1989

CASES
CODE FOR PRESSURE PIPING — B31

Case 153 Use of Alloy UNS S31803 Material in ASME B31.1 Construction

Inquiry. May solution annealed austenitic–ferritic stainless steel, 22Cr–5½Ni–3Mo alloy (UNS S31803), materials be used in ASME B31.1 construction?

Reply. The product specifications shown in Table 1 for solution annealed ferritic–austenitic steel, 22Cr–5½Ni–3Mo alloy, may be used in the construction of power piping complying with the rules of ASME B31.1, provided the following additional requirements are met.

(1) These materials shall not be used for Boiler External Piping. See Para. 100.1.2(A).

(2) Material shall be furnished in the heat treated condition. The heat treatment shall be performed at 1870°F to 2010°F with subsequent quenching in water or rapid cooling by other means.

(3) The allowable stress values shall be as follows:

For Metal Temperature Not Exceeding, °F	Max. Allowable Stress Values, ksi
100	22.5
200	22.5
300	21.7
400	20.9
500	20.4
600	20.2

(4) All longitudinal weld joints shall be completely examined by radiography. Radiographic examination shall be in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section VIII, latest Edition, UW-51.

(5) The Welding Procedure Qualification and Performance Qualifications shall be conducted in accordance with Section IX. For qualifying welding procedures, the material shall be considered as P-No. 10H Gr. No. 1 of QW-422.

(6) Heat treatment after forming or fabrication is neither required nor prohibited [except as noted in Para. (7)(e)], but any heat treatment applied shall be performed at 1870°F to 2010°F, followed by a rapid cool.

(7) Plate may be made into longitudinally welded pipe with filler metal added. Requirements of A 790 shall be met with the following modifications.

(a) The welds shall be made by an electric arc process involving the deposition of filler metal.

(b) The joints shall be full penetration double-welded or single-welded butt joints employing fusion welding processes, as defined under "Definitions," ASME Boiler and Pressure Vessel Code, Section IX. Where backing rings or strips are employed, the ring or strip material shall be of the same P-Number (QW-422 of Section IX) as the plate being joined. Backing rings or strips shall be completely removed after welding, prior to any required radiography, and the exposed weld surface shall be examined visually for conformance to the requirements of the following paragraph. Welds made by procedures employing backing rings which remain in place are prohibited.

(c) The weld surface on the O.D. side of the pipe shall be flush with the base plate or shall have a reasonably uniform crown in accordance with Table 127.4.2 in the Code. The weld surface on the I.D. side of the reinforcement may be removed at the manufacturer's option or by agreement between the manufacturer and purchaser. The contour of the reinforcement shall be reasonably

Case 153 continues on following page

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CASES
CODE FOR PRESSURE PIPING — B31

smooth and free of irregularities. The deposited metal shall be fused uniformly into the plate surface. No concavity of contour is permitted unless the resulting thickness of the weld metal is equal to or greater than the minimum thickness of the adjacent base metal.

(d) Weld defects shall be repaired by removal to sound metal and rewelding. Subsequent heat treatment and inspection shall be as required on the original welds.

(e) All welding shall be done prior to heat treatment. After welding, solution heat treatment shall be in accordance with para. 2.

(8) CAUTIONARY NOTE: This Case allows the use of this material only for the temperature range given in Para. (3). This material may be expected to exhibit embrittlement at room temperature after service above 600°F.

TABLE 1
ASTM PRODUCT SPECIFICATIONS

Piping	A 790-87
Tubing	A 789-87
Forgings	A 182-87
Plate, Sheet, and Strip	A 240-87
Bars and Shapes	A 276-87
Wrought Piping Fittings	A 815-86

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CASE 154
October 1989

CASES
CODE FOR PRESSURE PIPING — B31

Case 154 Use of Alloy UNS N06022 Material in ASME B31.1 Construction

Inquiry. May nickel–chromium–molybdenum–tungsten alloy (UNS N06022) materials be used for ASME B31.1 construction?

Reply. Yes, the product specifications shown in Table 1 for nickel–chromium–molybdenum–tungsten alloy (UNS N06022) may be used in the construction of power piping complying with the rules of ASME B31.1, provided the following additional requirements are met.

(1) These materials shall not be used for Boiler External Piping. See Para. 100.1.2(A).

(2) The maximum allowable stress values shall be as shown in Table 2. (Values listed shall be multiplied by a joint efficiency factor of 0.85 for longitudinally welded components.)

(3) Welded fabrication shall conform to the applicable requirements of B31.1.

(a) Welding Procedure and Performance Qualifications shall be conducted in accordance with Section IX, ASME Boiler and Pressure Vessel Code.

(b) All filler metal, including consumable insert material, shall comply with the requirements of Section IX.

(c) When welding repair of a defect is required, it shall be in accordance with ASME B31.1, para. 127.4.11. When a defect is removed but welding repair is unnecessary, the surface shall be contoured to eliminate any sharp notches or corners. The contoured surface shall be reinspected by the same means originally used for locating the defect to assure it has been completely removed.

(d) Heat treatment after fabrication is optional.

TABLE 1
ASTM PRODUCT SPECIFICATIONS

Seamless Piping & Tubing	B 622-87a
Welded Piping	B 619-87a
Welded Tubing	B 626-87a
Wrought Pipe Fittings	B 366-88
Bar Forging and Forging Stock	B 574-85
Plate, Sheet, and Strip	B 575-86a

Case 154 continues on following page

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Case 154
October 1989

CASES
CODE FOR PRESSURE PIPING — B31

TABLE 2

For Metal Temperature Not Exceeding, °F	Maximum Allowable Stress, ksi [Note (1)]	Maximum Allowable Stress, ksi
100	25.0	25.0
200	25.0	25.0
300	24.8	24.5
400	23.9	22.7
500	23.2	21.2
600	22.7	20.1
650	22.6	19.6
700	22.4	19.2
750	22.3	18.9
800	22.2	18.6

NOTE
(1) Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. These higher stress values exceed 67%, but do not exceed 90% of the yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction.

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ANSI/ASME B31.1
Interpretations No. 13

Replies to Technical Inquiries
January 1, 1988, Through June 30, 1988

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service to the Code. The interpretations have been assigned numbers in chronological order. Each interpretation applies to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. **The interpretations are not part of the Code or the Addenda.**

These replies are taken verbatim from the original letters, except for a few typographical and editorial corrections made for the purpose of improved clarity. In some instances, a review of the interpretation revealed a need for corrections of a technical nature. In these cases, a revised reply bearing the original interpretation number with the suffix R is presented. In the case where an interpretation is corrected by Errata, the original interpretation number with the suffix E is used.

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B31.1

Subject	Interpretation	File No.
Para. 127.5.3(A), Qualification and Documentation of Welding Procedures	13-2	B31-87-027
Para. 136.4.2, Application of Visual Examination	13-1	B31-87-005

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Interpretation: 13-1

Subject: Para. 136.4.2, Application of Visual Examination

Date Issued: January 5, 1988

File: B31-87-005

Question: Does Para. 136.4.2 require visual examination of welds before, during, or after manufacture, fabrication, assembly, or test?

Reply: No. The first paragraph of Para. 136.4.2 defines visual examination. The acceptance standards of Para. 136.4.2(A) apply to the completed weld. The second paragraph of Para. 136.1 specifies inspection requirements for the completed installation.

Interpretation: 13-2

Subject: Para. 127.5.3(A), Qualification and Documentation of Welding Procedures

Date Issued: January 5, 1988

File: B31-87-027

Question (1): What is the definition of a "technically competent group or agency" as used in Para. 127.5.3(A) of ANSI/ASME B31.1-1986 Edition?

Reply (1): Agreement between the fabricator and the owner determines whether an agency is competent to provide the qualified welding procedures to be used and is capable of meeting the requirements of Para. 127.5.3(A.1) through (A.4).

Question (2): Company A had competently qualified procedures in accordance with Para. 127.-5.1. Company A was dissolved and their assets (along with the rights to procedures) were purchased to form Company B. Company B has the same building, the same quality control and the same welders as Company A. May Company B use Company A's procedures through proper transfer by assuming the specific responsibility per Para. 127.5.3(A.4)?

Reply (2): Yes, provided all of the rules of Para. 127.5.3(A) are met to the satisfaction of the owner.

Question (3): For the situation described above, may Company B transfer Company A's performance qualifications for welders in its employ using the procedures qualified by Company A?

Reply (3): Yes, provided that all of the rules of Para. 127.5.3(B) are met to the satisfaction of the owner.

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B31.1 — Cases No. 8

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The Cases affected by this supplement are as follows:

Page	*Case*	*Change*
C-9	144	(1) Reaffirmed: May 1988 (2) New expiration date: May 31, 1991
C-11	145	(1) Reaffirmed: July 1988 (2) New expiration date: July 31, 1991
C-13	146	(1) Reaffirmed: July 1988 (2) New expiration date: July 31, 1991
C-29	149	Added
C-31	150	Added

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This case shall expire on November 30, 1991, unless previously annulled or reaffirmed

CASE 149
November 1988

CASES
CODE FOR PRESSURE PIPING — B31

Case 149 Use of ASTM A 182 Gr. F91

Inquiry: May material conforming to the chemical and mechanical requirements and other applicable requirements of ASTM A 182 Grade F91 be used for ANSI/ASME B31.1 construction?

Reply: It is the opinion of the Committee that modified 9Cr–1Mo material meeting the specified requirements of ASTM A 182 Grade F91 forgings may be used for ANSI/ASME B31.1 construction provided the additional following requirements are met. Preheat and postweld heat treatment shall be performed in accordance with Paras. 131 and 132 for P-No. 5 material.

The *allowable stress values* shall not exceed those listed in the Table.

Separate welding procedures and performance qualifications shall be required for this material. The welding procedure qualification and performance qualification shall be conducted as prescribed in Section IX.

For Metal Temperature Not Exceeding, °F	Maximum Allowable Stress Values, ksi
−20 to 100	21.3
200	21.3
300	21.2
400	21.2
500	21.1
600	20.8
650	20.5
700	20.0
750	19.4
800	18.7
850	17.8
900	16.7
950	15.5
1000	14.3
1050	12.9
1100	10.3
1150	7.0
1200	4.3

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CASE 149
November 1988

CASES
CODE FOR PRESSURE PIPING — B31

Case 150 Use of Cast Iron Blowoff Valves

Inquiry: May Class 250 cast iron valves be used in blowoff service where the maximum allowable working pressure of the boiler does not exceed 200 psig?

Reply: Pending revision to the Code, it is the opinion of the Committee that cast iron valves meeting the requirements of the applicable American National Standard for Class 250, as given in Table 126.1, may be used as blowoff valves as covered by Paras. 122.1.4 and 122.1.7(C) of ANSI/ASME B31.1-1986 Edition provided that the maximum allowable working pressure of the boiler does not exceed 200 psig. This shall be in lieu of the current Code limitation of 160 psig for the maximum allowable working pressure of the boiler when a cast iron blowoff valve is used. All other applicable requirements of the Code shall be met.

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ANSI/ASME B31.1

Interpretations No. 10

Cases No. 5

This update contains Interpretations No. 10 and Cases No. 5.

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ANSI/ASME B31.1
Interpretations No. 10

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B31.1

Subject	Interpretation	File No.
Para. 100.1.3(H), Piping Associated With Mechanical Equipment	10-3	B31-86-002
Para. 100.2, Definition of Inherent Parabolic Internal Pipe Contour	10-7	B31-86-028
Paras. 101.3 and 102.2, Use of Temperature Activated Stop Valves to Determine Design Temperature	10-1	B31-85-034
Para. 104.3.1(C.2), Reinforcement of Openings	10-6	B31-86-027
Para. 122.6.1, Stop Valves Used With Rupture Disks	10-4	B31-86-006
Para. 123.1, Use of Materials for Nonpressure Parts Welded to Pressure Parts	10-2	B31-85-026
Limits on Internal Weld Reinforcement	10-5	B31-86-015

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Interpretation: 10-1

Subject: Paras. 101.3 and 102.2, Use of Temperature Activated Stop Valves to Determine Design Temperature

Date Issued: August 26, 1986

File: B31-85-034

Question: Is it permissible to install temperature activated stop valves in a piping system that will ensure a maximum operating temperature of less than 775°F in downstream carbon steel piping as limited by the Notes to Table A-1 of ANSI/ASME B31.1?

Reply: The Code does not prohibit such an arrangement. It is the responsibility of the designer to ensure that the maximum sustained operating temperature remains within the limitations set forth in ANSI/ASME B31.1.

Interpretation: 10-2

Subject: Para. 123.1, Use of Materials for Nonpressure Parts Welded to Pressure Parts

Date Issued: November 18, 1986

File: B31-85-026

Question: Can a nonpressure-carrying welded shaped tubing purchased to ASTM A 554 be used and welded in accordance with the rules of ANSI/ASME B31.1 to a pressure retaining material?

Reply: The rules of ANSI/ASME B31.1 do not apply to the nonpressure-retaining part described in this inquiry. However, all effects resulting from the use of the nonpressure-retaining components shall be considered in the design of the pressure retaining part per requirements of Chapter II of the applicable edition of B31.1. The nonpressure-retaining part may be attached by fusion welding, provided the welding meets the requirements of Chapter V.

Interpretation: 10-3

Subject: Para. 100.1.3(H), Piping Associated With Mechanical Equipment

Date Issued: November 18, 1986

File: B31-86-002

Question: Is the lubrication system piping for the fans associated with a power boiler installation included within the scope of ANSI/ASME B31.1-1983 Edition, or is it excluded from the Code by the exclusion of mechanical equipment in Para. 100.1.3(H)?

Reply: The lubrication system piping for the fans associated with a power boiler installation is included in the scope of the B31.1 Power Piping Code; the exclusion in Para. 100.1.3(H) addresses the mechanical equipment, but not the piping connected to the mechanical equipment.

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Interpretation: 10-4

Subject: Para. 122.6.1, Stop Valves Used With Rupture Disks

Date Issued: November 18, 1986

File: B31-86-006

Question: On ANSI/ASME B31.1 power piping systems, is it permissible to install a locked-open full area stop valve on the inlet side of a rupture disk for repair and maintenance purposes only?

Reply: No.

Interpretation: 10-5

Subject: Limits on Internal Weld Reinforcement

Date Issued: November 18, 1986

File: B31-86-015

Question: Is it acceptable for the Owner to specify in contract documents a limitation on internal weld reinforcement on single welded butt joints?

Reply: It is not the policy of the B31.1 Committee to comment on the contractual agreements between the Owner and fabricator that are beyond the scope of ANSI/ASME B31.1.

Interpretation: 10-6

Subject: Para. 104.3.1(C.2), Reinforcement of Openings

Date Issued: November 18, 1986

File: B31-86-027

Question: Is it the intent of ANSI B31.1-1977 Edition that a branch connection conforming to the requirements of Para. 104.3.1(C.2) is sufficiently reinforced that a stress intensification factor need not be applied at the run pipe and branch intersection?

Reply: No. The intent of Para. 104.3.1(C.2) is to permit use of this construction without supporting calculation of reinforcement for pressure loading.

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Interpretation: 10-7

Subject: Para. 100.2, Definition of Inherent Parabolic Internal Pipe Contour

Date Issued: November 18, 1986

File: B31-86-028

Question: What is meant by the phrase "inherent parabolic internal pipe contour" contained in the definition of *centrifugally cast pipe* in Para. 100.2 of ANSI/ASME B31.1-1986 Edition?

Reply: The definition of *centrifugally cast pipe* was added to the B31.1 Power Piping Code with the 1967 Edition following acceptance of this material for code piping applications. As a result of the casting process, the internal surface may not be truly round and may consist of paraboloidal shapes (sections). Sections that are parallel to the plane of symmetry are parabolic in shape. Sections perpendicular to the plane of symmetry are either ellipses (elliptic paraboloids), hyperbolas (hyperbolic paraboloids), or circles (paraboloids of revolution).

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B31.1 — Cases No. 5

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The Cases affected by this supplement are as follows:

Page	*Case*	*Change*
C-3 (Cases No. 4)	136	(1) Reaffirmed December 1986 (2) New expiration date December 31, 1989
C-5 (Cases No. 4)	139	(1) Reaffirmed December 1986 (2) New expiration date December 31, 1989

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ANSI/ASME B31.1
Interpretations No. 9

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service. This supplement includes interpretations concerning B31.1 issued between January 1, 1986, and June 30, 1986. They have been assigned interpretation numbers in chronological order. Each interpretation applies to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. The interpretations are not part of the Code or the Addenda.

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B31.1

Subject	Interpretation	File No.
Para. 102.2.5(B) Pressure Reducing Valves in Steam Distribution Systems	9-8	B31-85-019
Para. 104.3.1(C.2), Design of Thermowell Connections	9-2	B31-85-004
Para. 115, Use of A 276 and A 479 in B31.1 Construction	9-10	B31-85-038
Appendix A, Allowable Stresses for A 139 Gr. B Spiral Welded Pipe	9-11	B31-85-040
Appendix A, Table A-3, Use of CF3M and 316L at Temperatures Above 850°F	9-4	B31-85-025
Table A-4, Allowable Stresses for B 407, Alloy 800, Hot Annealed	9-9	B31-85-035
Addition of ASTM A 194 Materials to Table 126.1	1-22E*	1436
Allowable Stresses for Carbon Steels	4-3E*	1599
Maximum Site of Socket Welded Components	9-6	B31-84-018
Temperature Limits for Soldered Joints	9-7	B31-84-21B
Underground District Heating Systems Restrained Piping	9-5	B31-83-015
Use of Cast Iron Thimbles and Valve Bodies in Boiler External Piping	9-1	B31-83-021
Welding of Identification Tags	9-3	B31-85-009

*The letter E indicates a reply which was corrected by Errata.

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Interpretation: 1-22E

Subject: Addition of ASTM A 194 Materials to Table 126.1

Date Issued: October 6, 1980

File: 1436

Question: Would the Committee consider adding ASTM A 194 Grades CZ-100, M-35, N-12M-1, N-12M-2, CY-40, CW-12M-1, and CW-12M-2 to the list of acceptable cast materials in Table 126.1 of ANSI/ASME B31.1? What allowable stress values shall apply?

Reply: Allowable stress values for materials accepted by this Committee are taken from the ASME Boiler and Pressure Vessel Code, Section I or Section VIII, Division I, or are established by reference to an ASTM specification for equivalent material when values for the equivalent material are shown in Section I or Section VIII, Division I. In the absence of published allowable stress values for ASTM A 194 material, or equivalent material in ASME Section I or Section VIII, Division I, it is the opinion of the Committee that this material is unacceptable for ANSI/ASME B31.1 components.

ASME Section VIII has published Code Case 1349-1 which permits the use of and lists allowable stress values at temperature for ASTM A 194-76 Grade CW-12M-1 only. The Committee is presently considering approval of a Case based on the ASME Section VIII Case. In the event approval by B31.1 takes place, such a case will be published in *Mechanical Engineering* magazine.

Allowable stress values are established by ASME for new materials in accordance with the policy spelled out in the ASME Boiler and Pressure Vessel Code, Section I, Appendix, A-75 through A-80 and A-150, or Section VIII, Division 1, Appendix B, UA-110 through UA-115 and Appendix P, UA-500. Approval of ASTM A 194 and the establishment of allowable stress values may be pursued through one of these channels.

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Interpretation: 4-3E

Subject: Allowable Stresses for Carbon Steels

Date Issued: July 14, 1983

File: 1599

Question (1): Why does ANSI/ASME B31.1, Appendix A, Table A-1 not list allowable stresses for carbon steels, such as ASME SA-106 Grade B, at temperatures above 800°F?

Reply (1): The reason is given in Note (3) of Table A-1, which states, "upon prolonged exposure to temperature above 775°F, the carbide phase of carbon steel may be converted to graphite."

Question (2): Some other Codes, such as the ASME Boiler and Pressure Vessel Code, Section I, do list allowable stresses for carbon steels at temperatures above 800°F. Is it the intention of the Committee to include in Table A-1 of ANSI/ASME B31.1 allowable stresses for carbon steels at temperatures above 800°F?

Reply (2): The stress values given in Table PG-23.1 of the ASME Boiler and Pressure Vessel Code, Section I for carbon steels at temperatures above 800°F are shown with parentheses. Note (b) of Table PG-23.1 states, "stress values shown in parentheses are permissible but, except for tubular products 3 in. O.D. or less enclosed within the boiler setting, use of these materials at these temperatures is not current practice under Section I." It is not appropriate to add these stress values to Table A-1 of ANSI/ASME B31.1.

Question (3): Does the Committee consider it acceptable to exceed the 800°F temperature figure for operation of ASME SA-106 Grade B pipework for a limited time period (up to 5000 hr) or an extended time period (up to 50,000 hr)?

Reply (3): Such usage is not acceptable as it does not comply with the requirements of ANSI/ASME B31.1.

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Interpretation: 9-1

Subject: Use of Cast Iron Thimbles and Valve Bodies in Boiler External Piping

Date Issued: January 14, 1986

File: B31-83-021

Question: According to ANSI/ASME B31.1 1983 Edition, may a cast iron thimble be mounted between an extra heavy flange and a standard flange located between a boiler and the first stop valve, and may a valve with a cast iron body be attached directly to a flange on the boiler proper?

Reply: The cast iron components described in the Question are considered to be within the jurisdictional limit of Boiler External Piping [reference Fig. 100.1.2 (B)]. Cast iron materials conforming to ASTM A 126, A 278, and A 395 may be used for such components. Pressure and temperature limitations on the use of these materials are contained in Paras. 123.2.4 and 123.2.6 and in Table A-5, Note (5). Limitations on the use of these materials for boiler external piping are contained in Paras. 122.1.3 (B.3), 122.1.7 (C.5), 122.1.7 (C.6), and in Table A-5, Notes (7), (8), and (9). Particular note should be taken of the warning given in Para. 123.2.4 regarding the use of cast iron where thermal or mechanical shock may occur.

Interpretation: 9-2

Subject: Para. 104.3.1 (C.2), Design of Thermowell Connections

Date Issued: January 14, 1986

File: B31-85-004

Question (1): Is it acceptable to fabricate a thermowell connection in accordance with the rules of Para. 104.3.1 (C.2) of ANSI/ASME B31.1-1983 Edition?

Reply (1): Yes.

Question (2): Is is acceptable to use a fitting, other than a coupling or half-coupling built in accordance with ANSI/ASME B16.11, to fabricate such a connection?

Reply (2): Yes, provided that all of the requirements of Para. 104.3.1 or Para. 104.7 are met.

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Interpretation: 9-3

Subject: Welding of Identification Tags

Date Issued: January 14, 1986

File: B31-85-009

Question: When welding a nonpressure part, such as an identification tag, to a pressure part using tack welds, is it permissible under ANSI/ASME B31.1-1983 Edition, to use an unqualified welding procedure and welding operator?

Reply: No, these are considered to be attachment welds and the rules of Chapter V of ANSI/ASME B31.1-1983 Edition must be met.

Interpretation: 9-4

Subject: Appendix A, Table A-3, Use of CF3M and 316L at Temperatures Above 850 F

Date Issued: January 14, 1986

File: B31-85-025

Question (1): Why does Table A-3 in Appendix A of ANSI/ASME B31.1 not list allowable stress values for low carbon grades of stainless steel (e.g., Type CF3M and 316L) at temperatures above 850°F?

Reply (1): The ASTM specifications for the low carbon grades of stainless steel limit the carbon content to less than 0.04%. The properties of stainless steels with carbon contents less than 0.04% are such that they are not suitable for use at elevated temperatures.

Question (2): Why do Notes (10) and (13) of Table A-3 state that the listed stress values at elevated temperatures apply only when the carbon content is 0.04% or higher?

Reply (2): These notes are applied to grades of stainless steel for which no minimum carbon content is required in the ASTM specification. These notes ensure that such materials are suitable for use at elevated temperatures. These notes are not required for the low carbon grades of stainless steel because allowable stress values at elevated temperatures are not listed for them.

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Interpretation: 9-5

Subject: Underground District Heating Systems Restrained Piping

Date Issued: March 6, 1986

File: B31-83-015

Question: Direct burial of preinsulated piping for low temperature (250°F) district heating distribution is common practice in Europe and is now being marketed in the United States with the warning that it is not in conformance with ANSI/ASME B31.1 Power Piping. Is the installation of piping which is constrained by its burial acceptable under the rules of B31.1?

Reply: ANSI/ASME B31.1-1983 Edition does not prohibit the use of buried restrained piping for district heating distribution service. However, neither does it provide specific rules for its design and installation.

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Interpretation: 9-6

Subject: Maximum Size of Socket Welded Components

Date Issued: March 6, 1986

File: B31-84-018

Question: What are the size limitations for the use of socket weld connections in ANSI/ASME B31.1-1983 Edition?

Reply: The size limitations for socket weld connections are shown in the following table.

Connection Type	Limitation on Maximum Size	B31.1 Reference
Flanges:		
Boiler external piping [reference 100.1.2, (A)]	3 in. for Class 600 and lower; 2½ for Class 1500	Para. 122.1.1(J)
Non-BEP	See Note (1)	Para. 106.1(A)
Fittings (except branch connections) in accordance with standards in Table 126.1	See Note (2)	Para. 106.1(A)
Branch fittings in accordance with standards in Table 126.1	See Note (2)	Para. 104.3.1(B.1)
Weld outlet branch fitting, except coupling	See Note (2)	Para. 104.3.1(B.2)
Coupling used as branch connection	3 in. NPS	Para. 104.3.1(B.2)
Welding branch directly to run, without fitting	2 in. NPS or ¼ nominal size of run, whichever is smaller	Para. 104.3.1(B.4.1.1)

NOTES:
(1) No specific size limit is imposed by B31.1; however, ANSI B16.5 limits Class 600 and lower to 3 in. and Class 1500 to 2½ in.
(2) No specific size limit is imposed by B31.1; however, ANSI B16.11 limits socket-weld fittings to 4 in. size.

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Interpretation: 9-7

Subject: Temperature Limits for Soldered Joints

Date Issued: March 6, 1986

File: B31-84-21B

Question: May soldered joints be used for occasional loads and temperature transients above 250°F?

Reply: No.

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Interpretation: 9-8

Subject: Para. 102.2.5(B), Pressure Reducing Valves in Steam Distribution Systems

Date Issued: March 6, 1986

File: B31-85-019

Question (1): In Para. 102.5.2(B), when a second reducing valve is placed in series with another pressure reducing valve and a downstream relief valve is not used, what is the required pressure rating of each valve?

Reply (1): Both must be designed for the pressure and temperature conditions on the high pressure side of the upstream valve.

Question (2): Does the requirement "Each . . . shall be individually connected to the source of operating minimum" imply that the valves may also be connected in parallel?

Reply (2): No. They must be in series, but capable of independent operation.

Question (3): If each pressure reducing valve is set to reduce a portion of the distribution system pressure, what are the rating requirements of the valves?

Reply (3): Both must be designed for the pressure and temperature conditions on the high pressure side of the upstream valve.

Question (4): If a trip valve is used in lieu of the second series pressure reducing valve and is set to close at the maximum safe working pressure of the equipment served, does B31.1 require that it be placed downstream of the pressure reducing valve?

Reply (4): No, but it must be capable of operating independently of the pressure reducing valve and protect both the downstream piping and the equipment served from overpressurization.

Question (5): May hand bypasses be installed around the series pressure relief valves if the downstream system and equipment is rated at less than the upstream distribution conditions and no relief valve is provided?

Reply (5): No.

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Interpretation: 9-9

Subject: Table A-4, Allowable Stresses for B 407, Alloy 800, Hot Annealed

Date Issued: March 6, 1986

File: B31-85-035

Question: ASTM B 407 includes the following grades of material: Alloy UNS No. 8800 (75 ksi tensile, 30 ksi yield), Alloy UNS No. 8800 (65 ksi tensile, 25 ksi yield) and Alloy UNS No. 8810 (65 ksi tensile, 25 ksi yield). Table A-4 of ANSI/ASME B31.1-1983 Edition contains four rows of allowable stress values for ASTM B 407 material. Which stress values apply to which grade?

Reply: The first two rows of allowable stress values, designated alloy No. 800 (75 ksi tensile), apply to alloy UNS No. 8800 (75 ksi tensile). The second two rows, designated alloy No. 800H (65 ksi tensile), apply to alloy UNS No. 8810 (65 ksi tensile). Table A-4 does not list allowable stress values for alloy UNS No. 8800 (65 ksi tensile).

Interpretation: 9-10

Subject: Para. 115, Use of A 276 and A 479 in B31.1 Construction

Date Issued: June 5, 1986

File: B31-85-038

Question (1): ASTM A 276 and ASTM A 479 are listed in Table 126.1 of ANSI/ASME B31.1 under the heading "Structural Components." Allowable stress values for these materials are not listed in Appendix A. May these materials be used to fabricate welded and compression type tube fittings?

Reply (1): Both materials may be used to fabricate compression type tube fittings in accordance with the rules of Para. 115 of ANSI/ASME B31.1. ASTM A 479 material may be used to fabricate welded tube fittings in accordance with the rules of Para. 104.7.

Question (2): What allowable stress values should be used for these materials?

Reply (2): Allowable stress values are not required for materials used in accordance with Para. 115. Stress values for ASTM A 479 are listed in Table PG-23.1 of Section I of the ASME Boiler and Pressure Vessel Code. Paragraph 102.3.1(A) of ANSI/ASME B31.1 permits the use of these stress values for B31.1.

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Interpretation: 9-11

Subject: Appendix A, Allowable Stresses for A 139, Gr. B, Spiral Welded Pipe

Date Issued: June 5, 1986

File: B31-85-040

Question: The ASTM A 139 specification includes both straight seam and spiral seam pipe. Do the stress values for A 139, listed in Table A-1, apply to both straight seam and spiral seam pipe?

Reply: Yes.

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B31.1—Cases No. 4

(The cases are not part of ANSI/ASME B31.1 or the Addenda and are included for information only.)

A "case" is the official method of handling a reply to an Inquiry when study indicates that the Code wording needs clarification, or when the reply modifies the existing requirements of the Code, or grants permission to use new materials or alternative constructions.

It has been agreed to publish cases issued by the B31 Committee concerning B31.1 as part of the update service to B31.1. The text of proposed new and revised cases will appear in *Mechanical Engineering* for public review. A notice will also appear in *Mechanical Engineering* when new and revised cases are approved. The cases will then appear with the next regularly scheduled update service.

Following this title sheet are all of the currently active cases concerning B31.1: Cases 136, 139, 143, 144, 145, and 146.

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CASE 136
April 1981

CASES
CODE FOR PRESSURE PIPING – B31

Case 136 – Use of Nickel-Iron-Chromium Alloys 800 and 800H

Inquiry: May nickel-iron-chromium alloys (800 and 800H) seamless condenser and heat exchanger tubes, rods, and bars, seamless pipe and tubes, plate, sheet, and strip, conforming respectively to ASME Specifications SB-163, SB-408, SB-407, and SB-409, be used in ANSI/ASME B31.1 construction?

Reply: It is the opinion of the Committee that nickel-iron-chromium alloy forms as shown in Table I may be used in ANSI/ASME B31.1 construction provided the following requirements and exceptions are satisfied:

1. Material shall not be used in Boiler External Piping.

2. Maximum material temperature shall not exceed 1200°F.

3. The maximum allowable design stress shall not exceed those listed in Table II.

4. Welded fabrication shall conform to the applicable requirements of ANSI/ASME B31.1.

a. The procedure and performance qualifications shall be conducted as prescribed in Section IX of the ASME Boiler and Pressure Vessel Code.

b. Welding shall be done by any welding process or combination of processes capable of meeting the requirements.

c. The use of filler metal that will deposit weld metal with the same composition as the material joined is recommended. When the manufacturer is of the opinion that a better corrosion-resistant joint can be made by departure from these limits, filler metal of a different composition may be used provided the strength of the weld metal at the operating temperature is not less than that of the high-alloy material to be welded, and user is satisfied that its resistance to corrosion is satisfactory for the intended service.

d. Heat treatment after forming or fabrication is neither required nor prohibited.

TABLE I

Form	ASME Specification
Seamless Condenser and Heat Exchanger Tubes	SB-163
Seamless Pipe and Tube	SB-407
Rods and Bars	SB-408
Plate, Sheet and Strip	SB-409

Case 136 continues on following page.

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CASES
CODE FOR PRESSURE PIPING – B31

TABLE II

For Metal Temperatures Not Exceeding (°F)	Stress, ksi			
	Alloy 800		Alloy 800H	
100	18.7	18.7[1]	16.2	16.2[1]
200	18.7	18.7	15.4	16.2
300	17.9	18.7	14.5	16.2
400	17.2	18.7	13.5	16.2
500	16.7	18.7	12.9	16.0
600	16.3	18.7	12.2	16.0
650	16.1	18.6	11.9	16.0
700	15.9	18.6	11.7	15.7
750	15.7	18.5	11.4	15.4
800	15.5	18.5	11.1	15.3
850	15.3	18.3	10.9	15.1
900	15.1	18.2	10.7	14.8
950	14.9	17.9	10.5	14.6
1000	14.7	17.6	10.3	14.4
1050	14.5	17.0	10.1	13.7
1100	13.0	13.0	10.0	13.5
1150	9.8	9.8	9.8	11.2
1200	6.6	6.6	8.4	8.4

[1]Due to the relatively low yield strength of these materials, the higher stress values were established at temperatures where the short-time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. These higher stress values exceed 62.5% but do not exceed 90% of their yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction.

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CASES
CODE FOR PRESSURE PIPING – B31

Case 139 – Rules for the Use of ASME SB-265 and ASME SB-337 Materials in ANSI/ASME B31.1. Construction

Inquiry: What additional rules shall apply to the use of materials conforming to ASME SB-265 and ASME SB-337 for the construction of piping in accordance with ANSI/ASME B31.1?

Reply: The following additional rules shall apply to the use of ASME SB-265 and ASME SB-337 materials for construction of piping in accordance with ANSI/ASME B31.1:

1. The following maximum allowable stress values shall apply to ASME SB-265 material and ASME SB-337 seamless pipe:

Metal Temperature Not Exceeding (°F)	Maximum Allowable Stress Values In Tension (ksi)			
	GR. 1	GR. 2	GR. 3	GR. 7
100	8.8	12.5	16.3	12.5
150	8.1	12.0	15.6	12.0
200	7.3	10.9	14.3	10.9
250	6.5	9.9	13.0	9.9
300	5.8	9.0	11.7	9.0
350	5.2	8.4	10.4	8.4
400	4.8	7.7	9.3	7.7
450	4.5	7.2	8.3	7.2
500	4.1	6.6	7.5	6.6
550	3.6	6.2	6.7	6.2
600	3.1	5.7	6.0	5.7

2. The stress values listed in 1. may be interpolated to determine values for intermediate temperatures.

3. For ASME SB-337 welded pipe and ASME SB-265 material formed into welded pipe, an efficiency factor of 0.85 shall be applied to the allowable stress values listed in 1.

4. Filler metal shall not be used in the manufacture of welded pipe.

5. Pipe shall comply with all the requirements of ASME SB-337, with the exception of dimensional requirements. Pipe dimensions shall comply with the requirements of ANSI B36.19-1976.

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CASE 143
April 1985

CASES
CODE FOR PRESSURE PIPING — B31

Case 143 Use of Grades 304 and 304H Austenitic Stainless Steel Piping Materials for Elevated Temperature Service in ANSI/ASME B31.1 Construction

Inquiry: May Grades 304 and 304H austenitic stainless steel piping materials be used for design temperatures above 1200°F up to and including 1500°F for ANSI/ASME B31.1 construction? What allowable stress values may be used?

Reply: It is the opinion of the Committee that the materials listed in Table I may be used for ANSI/ASME B31.1 construction for design temperatures up to and including 1500°F. The maximum allowable stress values for temperatures above 1200°F are listed in Table II.

TABLE I

Seamless Austenitic Stainless Steel Pipe ASTM A 312 Grades 304 and 304H
Seamless Austenitic Stainless Steel Pipe ASTM A 376 Grades 304 and Grades 304H
Welded Without Filler Metal — Austenitic Stainless Steel Pipe ASTM A 312 Grade 304 and 304H
Welded With Filler Metal Added — Austenitic Stainless Steel Pipe ASTM A 358 Grade 304
Stainless Steel Plate ASTM A 240 Grade 304
Stainless Steel Forgings ASTM A 182 Grades F304 and F304H
Wrought Austenitic Stainless Steel Pipe Fittings ASTM A 403 Grades WP304 and WP304H

Case 143 continues on following page.

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TABLE II

Material	Spec. No.	Type or Grade	Class	Notes	Maximum Allowable Stress Values in Tension in Thousands of Pounds per Square Inch for Metal Temp.,°F., Not Exceeding 1250	1300	1350	1400	1450	1500
Seamless Pipe										
18Cr–8Ni	A 312	TP304	...	(2)	4.7	3.7	2.9	2.3	1.8	1.4
18Cr–8Ni	A 312	TP304H	...	...	4.7	3.7	2.9	2.3	1.8	1.4
18Cr–8Ni	A 376	TP304	...	(2)	4.7	3.7	2.9	2.3	1.8	1.4
18Cr–8Ni	A 376	TP304H	...	...	4.7	3.7	2.9	2.3	1.8	1.4
Electric Fusion Welded Pipe — Without Filler Metal										
18Cr–8Ni	A 312	TP304	...	(2)(3)	4.0	3.1	2.5	2.0	1.5	1.2
18Cr–8Ni	A 312	TP304H	...	(3)	4.0	3.1	2.5	2.0	1.5	1.2
Electric Fusion Welded Pipe — Filler Metal Added										
18Cr–8Ni	A 358	304	1 & 3	(1)(2)(5)	4.7	3.7	2.9	2.3	1.8	1.4
18Cr–8Ni	A 358	304	2	(1)(2)(4)	4.2	3.3	2.6	2.1	1.6	1.3
Plate										
18Cr–8Ni	A 240	304	...	(2)(5)	4.7	3.7	2.9	2.3	1.8	1.4
Forgings and Fittings (Seamless and Welded)										
18Cr–8Ni	A 182	F304	...	(2)	4.7	3.7	2.9	2.3	1.8	1.4
18Cr–8Ni	A 182	F304H	...	...	4.7	3.7	2.9	2.3	1.8	1.4
18Cr–8Ni	A 403	WP304	WP-S	(1)(2)(5)	4.7	3.7	2.9	2.3	1.8	1.4
18Cr–8Ni	A 403	WP304	WP-W	(1)(2)(3)(5)	4.0	3.1	2.5	2.0	1.5	1.2
18Cr–8Ni	A 403	WP304H	WP-S	(1)(5)	4.7	3.7	2.9	2.3	1.8	1.4
18Cr–8Ni	A 403	WP304H	WP-W	(1)(3)(5)	4.0	3.1	2.5	2.0	1.5	1.2

NOTES:
(1) This material is not acceptable for boiler external piping.
(2) These values only apply when the carbon is 0.04% or higher for base material and filler metal.
(3) These stress values include a joint efficiency factor of 0.85.
(4) These stress values include a joint efficiency factor of 0.90.
(5) Material must be heat treated by heating it to a minimum temperature of 1900°F and quenching in water or rapidly cooling by other means.

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CASE 144
June 1985

CASES
CODE FOR PRESSURE PIPING — B31

Case 144 Use of Valves Conforming to MSS SP-84

Inquiry: May valves conforming to MSS SP-84 (1978 edition) be used for ANSI/ASME B31.1 piping systems?

Reply: Yes, provided that all valves are designed such that the valve stem is retained by an assembly which functions independently from the stem seal retainer.

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CASE 145
August 1985

CASES
CODE FOR PRESSURE PIPING — B31

Case 145 Nickel–Molybdenum–Chromium Alloys (UNS N10276), ANSI/ASME B31.1 Construction

Inquiry: May nickel–molybdenum–chromium alloy (UNS N10276) fittings, rod, plate, and strip, seamless and welded pipe and tube conforming to ASTM B 366, B 574, B 575, B 619, B 622, and B 626 be used for ANSI/ASME B31.1 construction?

Reply: It is the opinion of the Committee that nickel–molybdenum–chromium alloy (UNS N10276) may be used in ANSI/ASME B31.1 construction provided:

(1) the maximum allowable stress values for the material shall be those given in Table I. For welded components, these values shall be multiplied by a factor of 0.85.

(2) welded fabrication shall conform to the applicable requirements of B31.1.

(a) Welding Procedure and Performance Qualifications shall be conducted in accordance with Section IX, ASME Boiler and Pressure Vessel Code.

(b) Welding shall be done by any welding process capable of meeting the requirements.

(c) All filler metal, including consumable insert material, shall comply with the requirements of Section IX.

(d) When welding repair of a defect is required, it shall be in accordance with ANSI/ASME B31.1, Para. 127.4.11. When a defect is removed but welding repair is unnecessary, the surface shall be contoured to eliminate any sharp notches or corners. The contoured surface shall be reinspected by the same means originally used for locating the defect to assure it has been completely removed.

(e) Heat treatment after fabrication or forming is neither required nor prohibited.

(3) this Case number shall be identified in the Data Report.

Case 145 continues on following page.

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TABLE I

For Metal Temperature Not Exceeding, °F	Maximum Allowable Stress, ksi[1]	Maximum Allowable Stress, ksi
100	25.0	25.0
200	25.0	25.0
300	25.0	23.0
400	24.3	21.2
500	23.9	20.0
600	23.5	18.8
650	23.3	18.3
700	23.1	17.8
750	22.9	17.4
800	22.8	17.1
850	22.6	16.8
900	22.3	16.6
950	22.1	16.5
1000	21.8	16.5

NOTE:
(1) Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. These higher stress values exceed 67% but do not exceed 90% of the yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction.

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CASE 146
August 1985

CASES
CODE FOR PRESSURE PIPING — B31

Case 146 Use of ANSI/ASTM B 443-75, ANSI/ASTM B 444-75, and ANSI/ASTM B 446-75 in ANSI/ASME B31.1 Construction

Inquiry: May nickel–chromium–molybdenum–columbium alloys (UNS N06625) conforming to the requirements of ANSI/ASTM B 443-75, ANSI/ASTM B 444-75, and ANSI/ASTM B 446-75 be used for construction of ANSI/ASME B31.1 Power Piping systems? What allowable stress values may be used?

Reply: It is the opinion of the Committee that the nickel–chromium–molybdenum–columbium alloys listed in Table I may be used in the design and construction of ANSI/ASME B31.1 Power Piping systems provided the following requirements are met.

(1) THESE MATERIALS ARE NOT ACCEPTABLE FOR USE ON BOILER EXTERNAL PIPING. See Para. 100.1.2(A).

(2) The maximum allowable stress values shall be those listed in Table II.

(3) Design and construction shall conform to the applicable requirements of the Code and this Case.

(a) The Welding Procedure and Performance Qualifications shall be conducted in accordance with Section IX, Part QW, of the ASME Boiler and Pressure Vessel Code, except that the minimum tensile strength of reduced specimens in accordance with QW-462.1 shall not be less than 110,000 psi.

(b) Welding shall be done by any welding process or combination of processes capable of meeting the requirements.

(c) Postweld heat treatment of this material is neither required nor prohibited. However, no postweld heat treatment shall be performed except by agreement between the owner and the manufacturer, installer, or erector. The temperature, time, and method of heat treatment shall be covered by the agreement.

(d) The material shall be assigned a welding P-No. 43.

(e) Weld backing rings and backing strips, if used, shall be removed after completion of the weld when the design temperature is higher than 1100°F.

(4) All welds shall be subjected to nondestructive examination as specified below.

(a) All butt welds (longitudinal and circumferential) shall be examined by radiography over their total length for sizes over NPS 2 or when the nominal thickness of the base metal exceeds ⅜ in. regardless of diameter.

(b) All branch connection welds shall be examined by radiography over their entire length when the size of the branch exceeds NPS 4 or when the nominal thickness of the base metal exceeds ⅜ in. regardless of diameter. In lieu of radiography, the root pass, each ½ in. of weld thickness, and the final weld surface may be examined by the liquid penetrant method.

(c) All other welds not examined by radiography, including fillet welds and socket welds, shall be examined by the liquid penetrant method per Para. 136.4.4.

(d) All nondestructive examinations shall be performed and evaluated in accordance with requirements of Chapter VI.

(5) For design temperatures higher than 1100°F, the designer shall give consideration to the following recommendations:

(a) complete removal or contouring of the weld reinforcement to minimize stress concentrations;

(b) the use of tees or other forms of nonwelded branches when the branch size approaches the run size.

Case 146 continues on following page.

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TABLE I

Plate, sheet and strip	B 443-75
Seamless pipe and tube	B 444-75
Rod and bar	B 446-75

TABLE II
MAXIMUM ALLOWABLE STRESS VALUES

Spec. No.	Metal Temperature,[1] °F, Not Exceeding	Allowable Stress[2] Values, ksi
B 443 and B 446	300	27.5
	400	26.8
	500	26.1
	600	25.4
	700	25.0
	800	24.6
	900	24.0
	1000	23.7
	1100	23.4
	1150	21.0
	1200	13.2
B 444	300	30.0
	400	28.2
	500	27.0
	600	26.4
	700	26.0
	800	26.0
	900	26.0
	1000	26.0
	1100	26.0
	1150	21.0
	1200	13.2

NOTES:
(1) Alloy 625 suffers severe loss of impact strength after long-time aging in the temperature range 1000°F–1400°F.
(2) These stress values may be interpolated to determine values for intermediate temperatures.

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ANSI/ASME B31.1
Interpretations No. 8

It has been agreed to publish interpretations issued by the B31 Committee concerning B31.1 as part of the update service. This supplement includes interpretations concerning B31.1 issued between July 1, 1985, and December 31, 1985. They have been assigned interpretation numbers in chronological order. Each interpretation applies to the latest Edition or Addenda at the time of issuance of the interpretation or the Edition or Addenda stated in the reply. Subsequent revisions to the Code may have superseded the reply. The interpretations are not part of the Code or the Addenda.

These replies are taken verbatim from the original letters, except for a few typographical and editorial corrections made for the purpose of improved clarity. In some instances, a review of the interpretation revealed a need for corrections of a technical nature. In these cases, a revised reply, bearing the original interpretation number with the suffix R, is presented.

ASME procedures provide for reconsideration of these interpretations when or if additional information is available which the inquirer believes might affect the interpretation. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME committee or subcommittee. As stated in the Statement of Policy in the Code documents, ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

The interpretations will be issued twice a year up to the publication of the 1989 Edition. Interpretations Nos. 2 through 7 were included with the update service to the 1983 Edition. Interpretations Nos. 8 through 13 will be included with the update service to the 1986 Edition.

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B31.1

Subject	Interpretation	File No.
Design Temperature of Drain Piping	8-2	1655 (B31-83-008)
Paras. 100.1.3(E) and (H), Application of B31.1 to Piping Within Hydraulic and Pneumatic Equipment	8-3	B31-85-027
Para. 117.2, Qualification of Solderers	8-1	B31-85-016
Paras. 122.1.4(B.1) and 122.1.7(C.5), Design Pressure for Cast Iron Blowoff Valves	8-4	B31-84-023
Table 136.4, NDE of Hanger Support Welds	8-5	B31-84-034

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Interpretation: 8-1

Subject: Para. 117.2, Qualification of Solderers

Date Issued: August 16, 1985

File: B31-85-016

Question (1): Per Para. 117.2 of ANSI/ASME B31.1-1983 Edition, what standards listed in Table 126.1 cover requirements for soft-soldered, socket-type joints?

Reply (1): ANSI B16.18 and ANSI B16.22.

Question (2): For the purpose of qualification of procedures and personnel, are soft-soldered and brazing considered to be the same process?

Reply (2): No.

Question (3): To what specification and/or Code are personnel who perform soft-soldering qualified for ANSI/ASME B31.1 applications?

Reply (3): ANSI/ASME B31.1 does not specify qualification requirements for personnel performing soft-soldering.

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Interpretation: 8-2

Subject: Design Temperature of Drain Piping

Date Issued: August 21, 1985

File: 1655 (B31-83-008)

Question (1): What rules of ANSI/ASME B31.1 apply to the selection of design temperatures for vent, drain, and instrument piping?

Reply (1): The rules of Para. 101.3.2 apply for all piping, including vent, drain, and instrument piping.

Question (2): Can Para. 122.3.2 be used for selecting a lower design temperature for instrument piping?

Reply (2): No. The rules of Para. 122.3.2 are requirements for instrument piping that must be met. The application of some of the rules depends upon the design temperature selected.

Question (3): What rules apply to the selection of materials for "Sampling Piping" covered by Paras. 122.3(B) and 122.3.4?

Reply (3): The requirements of Para. 122.3.4(C.1) apply.

Question (4): What nondestructive examination is required for miter welds as addressed in Para. 104.3.3?

Reply (4): The requirements of Paras. 136.4.1 and 136.4.2 apply to miter welds.

Question (5): Are there any maximum temperature limits for the use of miter welds?

Reply (5): No.

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Interpretation: 8-3

Subject: Paras. 100.1.3(E) and (H), Application of B31.1 to Piping Within Hydraulic and Pneumatic Equipment

Date Issued: October 15, 1985

File: B31-85-027

Question (1): Does ANSI/ASME B31.1 apply to the pneumatic, hydraulic, lubrication, or cooling water systems of machinery or machine tools used in a manufacturing plant including, but not limited to, lathes, washers, machining centers, material handling devices, injection molders, coil handlers, presses, robots, automated tooling, or automated manufacturing systems?

Reply (1): No. These devices are considered to be tools and components subject to Para. 100.1.3(E).

Question (2): Does ANSI/ASME B31.1 apply to the piping, flexible tubing, or hoses (drop lines) connecting hydraulic or pneumatic distribution systems to the machinery or machine tools used in a manufacturing plant?

Reply (2): No. ANSI/ASME B31.1 does not apply to hydraulic or pneumatic equipment downstream of the connection between this equipment and the plant hydraulic or pneumatic distribution system.

Interpretation: 8-4

Subject: Paras. 122.1.4(B.1) and 122.1.7(C.5), Design Pressure for Cast Iron Blowoff Valves

Date Issued: November 8, 1985

File: B31-84-023

Question: What is the maximum allowable working pressure of a boiler on which a cast iron blowoff valve may be used?

Reply: 160 psig, provided that the requirements of Para. 123.2.4 of ANSI/ASME B31.1 are met.

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Interpretation: 8-5

Subject: Table 136.4, NDE of Hanger Support Welds

Date Issued: November 8, 1985

File: B31-84-034

Question (1): Does Table 136.4 and the notes thereto apply to the examination of piping support or hanger welds which are not connected to the pressure boundary?

Reply (1): Standard support and hanger welds which are not connected to the pressure boundary are covered by MSS-SP-58 (see Para. 130.1). Special supports and hangers shall be fabricated and examined in accordance with ANSI/ASME B31.1 (see para. 130.2).

Question (2): Is visual examination for the characteristics of Para. 136.4.2 required for those welds which pass the required pressure tests when the welds do not require testing (other than visual) by Para. 136.4.1 of ANSI/ASME B31.1?

Reply (2): Yes.

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Interpretations No. 6 to ANSI/ASME B31.1

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These replies are taken verbatim from the original letters, except for a few typographical and editorial corrections made for the purpose of improved clarity. In some instances, a review of the Interpretation revealed a need for corrections of a technical nature. In these cases, a revised reply, bearing the original Interpretation Number with the suffix R, is presented.

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B31.1

Subject	Interpretation	File No.
Use of ASTM A 53 Pipe	6-1	1636
Welded Branch Connections	6-2	B31-84-004

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Interpretation: 6-1

Subject: Use of ASTM A 53 Pipe

Date Issued: July 31, 1984

File: 1636

Question (1): Does Para. 105.2.1(B) apply to steel pipe manufactured to ASTM A 53 Type F, which is dual marked "A-120–A-53"?

Reply (1): No.

Question (2): Is it permissible to use steel pipe manufactured to ASTM A 53 Type F, which is dual marked "A-120–A-53," for ANSI/ASME B31.1 welded construction?

Reply (2): Yes, provided all the applicable requirements of ANSI/ASME B31.1 for materials and welded construction are met. Note that ASTM A 53 does not set limits for carbon content of Type F pipe. Paragraph 123.2.3(C) does not permit the use of material with carbon content in excess of 0.35% for welded construction.

Interpretation: 6-2

Subject: Para. 127.4.8, Welded Branch Connections

Date Issued: September 17, 1984

File: B31-84-004

Question: When a branch connection is inserted through an opening cut in the run wall, does ANSI/ASME B31.1 require that the end of the branch connection be trimmed to match the internal contour of the run pipe?

Reply: Yes. See 127.4.8(C).

Errata

Supplement No. 4 Interpretation 4-3	*Correct* Question (1) *to read:* Question (1): Why does ANSI/ASME B31.1, Appendix A Table A-1 not list allowable stresses for carbon steels, such as ASME SA-106 Grade B, at temperatures above 800°F?

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B31.1 — Cases No. 2

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A "Case" is the official method of handling a reply to an Inquiry when study indicates that the Code wording needs clarification, or when the reply modifies the existing requirements of the Code, or grants permission to use new materials or alternative constructions.

It has been agreed to publish Cases issued by the B31 Committee concerning B31.1 as part of the subscription service to B31.1. The text of proposed new and revised Cases will appear in *Mechanical Engineering* for public review. A notice will also appear in *Mechanical Engineering* when new and revised Cases are approved. The Cases will then appear with the next regularly scheduled Addenda to B31.1.

Following this title sheet is Case 142, which applies to all B31 Codes.

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CASE 142
July 1984

This Case shall expire on July 31, 1987 unless previously annulled or reaffirmed.

CASES
CODE FOR PRESSURE PIPING – B31

Case 142 Capacitor Discharge Method of Welding

Inquiry: May the capacitor discharge method of welding be used to temporarily attach thermocouples to pressure parts to measure metal temperature either when preheating or during postweld heat treatment, or both, of piping components for B31 construction and may this be done without performance and procedure qualification?

Reply: It is the opinion of the Committee that the capacitor discharge method of welding may be used for B31 construction to temporarily attach thermocouples directly to the pressure parts to measure metal temperature either when preheating or during postweld heat treatment, or both, of piping components provided the thermocouple is removed and the area is visually examined in accordance with the applicable ANSI/ASME B31 Code requirements. Performance and procedure qualifications are not required.

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Interpretations No. 5 to ANSI/ASME B31.1

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Interpretation: 5-1

Subject: Scope of the B31 Codes

Date Issued: February 21, 1984

File: 1607

Question: What ANSI/ASME B31 Code is the applicable Code for a steam line transferring steam from a power house to the interior of a tobacco plant?

Reply: ANSI/ASME B31.1 is applicable to all power and auxiliary service piping in the power plant.

The applicable Code for the transfer line and any distribution within the tobacco plant depends upon its purpose. If used to generate power, ANSI/ASME B31.1 applies. If used as building services, ANSI/ASME B31.9 applies. If used as part of a chemical process, ANSI/ASME B31.3 applies.

If the piping is clearly not within the scope of these or other B31 Codes, B31 Case 137 permits the user to select any B31 Code System determined to be generally applicable.

Interpretation: 5-2

Subject: Para. 137, Leak Test

Date Issued: March 2, 1984

File: 1550

Question (1): Paragraph 137.1.1 requires boiler external piping to be hydrostatically tested in accordance with ASME Boiler and Pressure Vessel (BPV) Code, Section I, PG-99. PG-99.3 allows a hydrostatic test stress up to 90% of yield for forced-flow boilers. Is there a similar stress limitation for drum-type boilers?

Reply (1): Since this question deals primarily with boiler type, the inquirer should refer to ASME BPV Code Interpretation I-82-11.

Question (2): May a main steam line with a design pressure as determined by Para. 122.1.2 (A.4) by hydrostatically tested with the boiler which may have a greater pressure than the main steam design pressure?

Reply (2): Yes. The main steam line may be hydrostatically tested with the boiler as outlined in ASME BPV Code, Section I, PG-99. The limits of stress to be imposed on the piping during the hydrostatic test are given in ANSI/ASME B31.1, Paras. 137.3.4 and 137.1.2(g).

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Interpretation: 5-3

Subject: Para. 127.4.2, Girth Butt Welds

Date Issued: March 2, 1984

File: 1672 (B31-83-025)

Question: Is it a requirement of ANSI/ASME B31.1 that the outside surface of the weld level described in Para. 127.4.2(A) extend to the outside diameter of the adjacent component when components of equal outside diameter having no external transition angles beyond the weld groove are joined together with a full penetration weld thickness equal to or greater than the minimum thickness required by Chapter II?

Reply: Yes.

Interpretation: 5-4

Subject: Qualification of Personnel Who Perform Nondestructive Examination in Accordance with Para. 136.1.

Date Issued: March 5, 1984

File: 1629

Question (1): Are personnel who perform the visual examination required by Table 136.4 on boiler external piping required to be qualified and certified in accordance with Paras. 136.1(A), (B), (C), (D), and (E) of ANSI/ASME B31.1?

Reply (1): Yes.

Question (2): If the answer to Question (1) is yes, what guidelines should be used to develop a training and examination program for visual examiners?

Reply (2): The manufacturer, contractor, or fabricator is responsible for including such specification for experience, training, instructions, etc., to be included in his quality control system and acceptable to the designated authorities.

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Interpretation: 5-5

Subject: Full Penetration Welds in Para. 127.4

Date Issued: March 5, 1984

File: 1680 (B31-83-033)

Question: For welds that only require visual examination in accordance with Table 136.4 in which the root of the weld is not accessible, and where the leak test required by Para. 137 has been passed, are the full penetration welds specified by Para. 127.4 required?

Reply: Yes.

Interpretation: 5-6

Subject: Para. 122.1.4, Blowoff and Blowdown Piping

Date Issued: March 5, 1984

File: 1692 (B31-83-045)

Question: Does ANSI/ASME B31.1 have a maximum size limitation for a pipeline from a boiler steam drum to a flash tank which is designed to give a high flow rate in order to rapidly reduce high boiler water impurities and is used only during boiler startup?

Reply: Paragraph 122.1.4 of ANSI/ASME B31.1-1980, as revised in the Summer 1981 Addenda, identifies this service as blowdown for which there is no maximum size limitation specified.

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Interpretation: 5-7

Subject: Qualification of Personnel Who Perform Nondestructive Examination in Accordance With Para. 136.1.

Date Issued: March 27, 1984

File: 1657 (B31-83-010)

Question: Do Para. 136.1 and Table 136.4 require personnel who perform visual examination in accordance with Table 136.4 to be qualified and certified for the visual examination method in accordance with the owner's (or his agent's) program, based on the minimum requirements of Para. 136.1(A), (B), (C), (D), or (E), or the alternatives listed in Para. 136.1, as acceptable?

Reply: Yes, the requirements for the qualification and certification of personnel performing visual examination on boiler external piping or nonboiler external piping are included in Para. 136.1 and Table 136.4. Boiler external piping is under the total administrative jurisdiction of ASME Boiler and Pressure Vessel Code, Section I. Therefore, Para. 136.1 applies and the stampholder is responsible to include the required specifications for experience, instructions, training, etc., in his Quality Control System. Nonboiler external piping is under the total administrative and technical requirements of B31. Therefore, Para. 136.1 still applies and the fourth paragraph specifies the requirements.

Interpretation: 5-8

Subject: Use of Bar Stock Material

Date Issued: June 20, 1984

File: 1634

Question (1): May 3 in. and 4 in. welding-end pipe caps manufactured by machining from bar stock conforming to ASTM A 576 Grade 1018 or A 276 Type 316 be used where conformance to ANSI/ASME B31.1 is required?

Reply (1): No. The referenced materials may only be used for nonpressure-carrying parts in accordance with Para. 102.3.1 (D).

Question (2): What other bar stock materials may be used under similar circumstances?

Reply (2): Appropriate materials for which stress values are available may be selected from Appendix A for the particular design parameters.

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Interpretation: 5-9

Subject: Allowable Stress Values

Date Issued: June 20, 1984

File: 1645

Question: May the allowable stress values listed in Table PG-23.1 of the ASME Boiler and Pressure Vessel Code, Section I, for TAC Austenitic Stainless Steels (Types 304, 304H, 316, and 316H) at temperatures over 1200°F to 1500°F be used for the design of stainless steel pipe under ANSI/ASME B31.1?

Reply: No (see Paras. 105.1 and 123.2.1 of ANSI/ASME B31.1). However, the Committee is presently considering increasing the temperature range of the allowable stress tables to 1500°F.

Interpretation: 5-10

Subject: Requirements for Relief Valves

Date Issued: June 20, 1984

File: 1679 (B31-83-032)

Question: Must a relief valve installed on a line valve to protect the valve from overpressurization due to fluid thermal expansion [Para. 107.1(C)] meet the requirements of Para. 107.8.3?

Reply: Yes, however, for this particular application, there are several other relief devices which provide overpressure protection. Refer to UG-129(e) of ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 for further information on this subject.

Interpretation: 5-11

Subject: Fig. 127.4.4(C), Minimum Welding Dimensions Required for Socket Welding Components Other Than Flanges

Date Issued: June 20, 1984

File: 1685 (B31-83-038)

Question: In applying Fig. 127.4.4(C), should the fillet weld at the socket using 1 in. Schedule 160 pipe be 0.195 in. using design requirements, or 0.272 in. based upon the actual use of 1 in. Schedule 160 (0.250 in. wall) pipe?

Reply: The fillet weld size using 1 in. Schedule 160 pipe must be 0.272 in. or the thickness of the socket wall, whichever is smaller.

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Interpretation: 5-12

Subject: Qualification of Personnel Who Perform Examinations for Leakage in Accordance With Para. 137

Date Issued: June 20, 1984

File: B31-84-002

Question: Is it a requirement of ANSI/ASME B31.1 that personnel who perform examinations for leakage in accordance with Paras. 137.3, 137.4, 137.5, and 137.6 be qualified and certified in accordance with Para. 136.1?

Reply: No.

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B31.1

Subject	Interpretation	File No.
Para. 122.1.4, Blowoff and Blowdown Piping	5-6	1692 (B31-83-045)
Para. 127.4.2, Girth Butt Welds	5-3	1672 (B31-83-025)
Para. 137, Leak Test	5-2	1550
Fig. 127.4.4(C), Minimum Welding Dimensions Required for Socket Welding Components Other than Flanges	5-11	1685 (B31-83-038)
Allowable Stress Values	5-9	1645
Full Penetration Welds in Para. 127.4	5-5	1680 (B31-83-033)
Qualification of Personnel Who Perform Nondestructive Examination in Accordence with Para. 136.1	5-4	1629
Qualification of Personnel Who Perform Nondestructive Examination in Accordance with Para. 136.1	5-7	1657 (B31-83-010)
Qualification of Personnel Who Perform Nondestructive Examination in Accordance with Para. 137	5-12	B31-84-002
Requirements for Relief Valves	5-10	1679 (B31-83-032)
Scope of the B31 Codes	5-1	1607
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Interpretations No. 4 to ANSI/ASME B31.1

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B31.1

Subject	Interpretation	File No.[1]
Para. 105.3, Nonmetallic Pipe	4-9	1617-2
Allowable Stresses for Carbon Steels	4-3	1599
Appendix II Nonmandatory Rules for the Design of Safety Valve Installations	2-10*	1573R*
Area of Reinforcement for Contoured Integrally Reinforced Fittings	4-8	1681
B31.1 and B31.3, Synfuel Plant Piping	1-45R*	1541R*
Definition of "a few" in Appendix II	4-5	1644
Double Valving	4-2	1665
Fire Protection Piping	4-12	1642
Materials for Boiler External Piping	4-11	1675
Nondestructive Examination	4-10	1664
Postweld Heat Treatment	4-6	1591
Postweld Heat Treatment	4-7	1654
Postweld Heat Treatment Requirements	4-13	1653
Qualification of Welding Procedures	4-1	1606
Relief Valve Discharge Stack Piping	4-4	1585

[1]Asterisk indicates reply has been revised one or more times.

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Interpretation: 1-45R

Subject: B31.1 and B31.3, Synfuel Plant Piping

Dated Issued: October 26, 1983

File: 1541R (83-034)

Question: What section of the ASME Code for Pressure Piping, B31, may be used for materials, design, fabrication, assembly, erection, examination, inspection, and test of piping within coal based synfuels plants for the production of electric power or industrial steam, or both, primarily for use within the plant?

Reply: ANSI/ASME B31.1 applies to piping associated with power boilers and subject to the ASME Boiler and Pressure Vessel Code, Section I inspection and stamping [see B31.1, Para. 100.1 and Figs. 100.1.2 (A) and (B)].

Either ANSI/ASME B31.1 or B31.3 is applicable to other piping associated with the production or distribution of industrial steam or the production of electric power primarily for use within the plant (see B31.3, Fig. 300.1.1).

ANSI/ASME B31.3 applies to all other piping primarily for use within the plant.

Interpretation: 2-10R

Subject: Appendix II Nonmandatory Rules for the Design of Safety Valve Installations

Date Issued: July 25, 1983

File: 1573R

Question: In Appendix II of ANSI/ASME B31.1, what gas parameters a and b are to be used for dry air and freon 114 in the following equation, taken from Para. 2.2.1(1):

$$P_1 = \frac{W_1}{A_1} \frac{(b - 1)}{b} \sqrt{\frac{2\,(h_o - a)J}{g_c\,(2b - 1)}}$$

Reply: The equation in question is based on an empirical formula relating to energy and steam properties near the saturation region at sonic velocity. It would not be appropriate to use for dry air or freon 114.

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Interpretation: 4-1

Subject: Qualification of Welding Procedures

Date Issued: July 13, 1983

File: 1606 (83-018)

Question (1): Can ASTM A 356 Grades 8 and 9 materials not currently listed in Appendix A, Table A-2 of ANSI/ASME B31.1 be treated as P-No. 4 materials as permitted by Para. 127.5.1?

Reply (1): No. Paragraph 127.5.1 applies only to materials listed in Appendix A for which no P-Number has been assigned by the ASME Boiler and Pressure Vessel Code, Section IX.

Question (2): What is the installer's responsibility for installing/welding ASTM A 356 Grades 8 and 9?

Reply (2): The installer must qualify a WPS in accordance with the ASME Boiler and Pressure Vessel Code, Section IX. However, the ANSI/ASME B31.1 Code does not authorize the use of ASTM A 356 Grades 8 and 9 for piping within the scope of that Code.

Interpretation: 4-2

Subject: Double Valving

Date Issued: July 13, 1983

File: 1665

Question: Is double valving of a channel drain on a feedwater heater required by the ANSI/ASME B31.1 Power Piping Code?

Reply: No. A single drain valve satisfies Code requirements for this service.

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Interpretation: 4-3

Subject: Allowable Stresses for Carbon Steels

Date Issued: July 14, 1983

File: 1599 (83-033)

Question (1): Why does ANSI/ASME B31.1 Appendix A, Table A-1 not list allowable stresses for carbon steels, such as ASME SA-106 Grade B, at temperatures above 188°F?

Reply (1): The reason is given in Note (3) of Table A-1, which states, "upon prolonged exposure to temperature above 775°F, the carbide phase of carbon steel may be converted to graphite."

Question (2): Some other Codes, such as the ASME Boiler and Pressure Vessel Code, Section I, do list allowable stresses for carbon steels at temperatures above 800°F. Is it the intention of the Committee to include in Table A-1 of ANSI/ASME B31.1 allowable stresses for carbon steels at temperatures above 800°F?

Reply (2): The stress values given in Table PG-23.1 of the ASME Boiler and Pressure Vessel Code, Section I for carbon steels at temperatures above 800°F are shown with parentheses. Note (b) of Table PG-23.1 states, "stress values shown in parentheses are permissible but, except for tubular products 3 in. O.D. or less enclosed within the boiler setting, use of these materials at these temperatures is not current practice under Section I." It is not appropriate to add these stress values to Table A-1 of ANSI/ASME B31.1.

Question (3): Does the Committee consider it acceptable to exceed the 800°F temperature figure for operation of ASME SA-106 Grade B pipework for a limited time period (up to 5000 hr) or an extended time period (up to 50,000 hr)?

Reply (3): Such usage is not acceptable as it does not comply with the requirements of ANSI/ASME B31.1.

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Interpretation: 4-4

Subject: Relief Valve Discharge Vent Stack Piping

Date Issued: August 17, 1983

File: 1585

Question (1): In ANSI/ASME B31.1-1980 Edition, does the 800°F maximum allowable temperature limitation of Table A-1 for carbon steel piping apply to relief valve discharge vent stack piping when steam temperatures in excess of 800°F are calculated to exist only during the short time duration of relief valve actuation?

Reply (1): Not necessarily. The limitation mentioned in the question derives from Para. 123.2.1, which states, "The materials listed in the allowable stress Tables A-1 through A-7, Appendix A, shall not be used at design temperatures above those for which stress values are given." Table A-1 of Appendix A does not give allowable stress values for carbon steel materials at temperatures above 800°F.

The condition described in the question is a self-limiting transient. Per Para. 101.3.2(A), the design temperature must be selected to equal or to exceed the maximum sustained condition. The selected design temperature need not exceed the maximum temperature attained during a transient. Conditions during a self-limiting transient must not exceed the limitations of Para. 102.2.4.

In order to show that the limitations of Para. 102.2.4 are met, the allowable stress value at the transient condition must be determined. For the condition described in the question, the allowable stress value during the transient must be obtained from Section I or Section VIII, Division 1, of the ASME Boiler and Pressure Vessel Code, as permitted by the rules of Para. 102.3.1(a).

Note (3) of Table A-1 warns the designer of possible graphitization due to prolonged exposure to temperatures above 775°F.

Question (2): Does the requirement of Para. 136.4.5 for radiography of piping welds with design temperatures in excess of 750°F apply to relief valve discharge vent stack piping?

Reply (2): Yes.

Interpretation: 4-5

Subject: Definition of "a few" in Appendix II

Date Issued: September 7, 1983

File: 1644

Question: What is the definition of the phrase "a few" in ANSI/ASME B31.1-1980 Edition, Appendix II, Para. 2.3.2?

Reply: There is no quantitative intent in the term "a few" as used in ANSI/ASME B31.1-1980 Edition, Appendix II, 2.3.2 other than to reinforce the short duration of the momentary unbalanced forces. The duration of the unbalanced forces is governed by the safety valve design, the system in which the safety valve is installed, and operating fluid characteristics.

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Interpretation: 4-6

Subject: Postweld Heat Treatment

Date Issued: September 12, 1983

File: 1591 (83-007)

Question (1): Is postweld heat treatment of welds required by Table 131 of ANSI/ASME B31.1-1980 Edition under the following conditions for P-4 materials?

(a) a maximum thickness of ½ in.;

(b) a maximum nominal pipe size of 4;

(c) butt welded or socket welded fitting to ASTM A 234 WP11 of A 182 Grade F11 with an ASTM specification limit of 0.20% carbon, maximum. Fittings are procured with only a Certificate of Compliance to the ASTM specification (i.e., the actual percentage of carbon is not known). The fittings are used in conjunction with ASTM A 335 Grade P11 (maximum carbon of 0.15%) pipe.

(d) application of 300°F minimum preheat.

Reply (1): Postweld heat treatment is required under the conditions outlined above.

Question (2): Can the Design Engineer exempt postweld heat treatment of P-No. 4 materials when those materials are purchased to an ASTM specification, with a limitation on the carbon to 0.15%?

Reply (2): Postweld heat treatment of the ASME Boiler and Pressure Vessel Code, Section IX, P-No. 4 materials are exempted if all the requirements of Table 131 are met. The methods used to verify these exemptions are not addressed in the Code.

Interpretation: 4-7

Subject: Postweld Heat Treatment

Date Issued: September 12, 1983

File: 1654

Question: Are any alternative methods to heating a full circumferential band during PWHT acceptable to ANSI B31.1-1977 Edition, including the Summer 1978 Addenda?

Reply: No.

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Interpretation: 4-8

Subject: Area of Reinforcement for Contoured Integrally Reinforced Fittings

Date Issued: October 26, 1983

File: 1681

Question: Do the rules for extruded outlets apply to contoured integrally reinforced fittings? If not, what are the correct equations indicated in ANSI/ASME B31.1, B31.2, B31.3, B31.4, and B31.8 to be used in determining the limits of area reinforcement for contoured integrally reinforced branch connecting fittings (e.g., weldolet) and extruded outlets?

Reply: The contoured integrally reinforced fitting is not an extruded outlet. The equations set forth in the B31 Codes for determining the reinforcing limits of an extruded outlet do not apply in determining the reinforcing limits of a contoured integrally reinforced fitting.

The equations set forth in the Code documents for fabricated intersection area reinforcement limits are the only equations available for contoured integrally reinforced branch connecting fittings.

Interpretation: 4-9

Subject: Para. 105.3, Nonmetallic Pipe

Date Issued: November 7, 1983

File: 1617-2 (83-017)

Question (1): May reinforced thermosetting resins made to such standards as ASTM C 582, D 2517, D 2996, or D 2997 be used in any water piping systems covered by ANSI/ASME B31.1?

Reply (1): ANSI/ASME B31.1. permits the use of nonmetallic piping materials. See Paras. 105.3(A) and 123.2.8.

Question (2): If these materials may be used under ANSI/ASME B31.1, what allowable stress values should be used for design and what are the allowable pressure and temperature ranges?

Reply (2): Design stress and temperature limits shall be within the manufacturer's recommendations.

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Interpretation: 4-10

Subject: Nondestructive Examination

Date Issued: November 7, 1983

File: 1664 (83-028)

Question: Does ANSI/ASME B31.1-1980 Edition require any nondestructive examinations in addition to those stated in Table 136.4?

Reply: No. See 136.1, second paragraph, for guidance on additional examinations.

Interpretation: 4-11

Subject: Materials for Boiler External Piping

Date Issued: November, 7, 1983

File: 1675

Question: Since the ANSI/ASME B31.1 Power Piping Code allows the substitution of API 5L pipe for ASTM A 53 pipe per 105.2.1(D), why does Note (1) of Appendix A, Table A-1, disallow the use of API 5L pipe for boiler external piping?

Reply: ANSI/ASME B31.1, 123.1 specifically limits boiler external piping materials to either ASME or ASTM specifications for ASME Code certification of the piping.

Interpretation: 4-12

Subject: Fire Protection Piping

Date Issued: November 8, 1983

File: 1642 (83-006)

Question: May ASTM A 120 pipe be used in a fire protection system covered by ANSI/ASME B31.1 with design conditions of 150 psig and 150°F?

Reply: The requirements of ANSI/ASME B31.1 do not apply to fire protection piping. See 100.1.3(D). When compliance with ANSI/ASME B31.1 is required by either NFPA Code/Standard reference or agreement between the parties concerned, then the pressure limitation of 125 psig for straight ASTM A 120 pipe (or 25 psig if bending is used) dictated by 105.2.1(B) of ANSI/ASME B31.1 must be met.

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Interpretation: 4-13

Subject: Postweld Heat Treatment Requirements

Date Issued: December 12, 1983

File: 1653

Question: In repairing previously heat treated welds, is it permissible in accordance with ANSI B31.1-1973 Edition to determine the postweld heat treatment requirements based on a depth of the weld repair? If not, what parameters are to be used to determine the stress relieving requirements?

Reply: The thickness of the material being repaired shall determine the postweld heat treatment requirements.

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Interpretations No. 3 to ANSI/ASME B31.1

(This supplement is not part of ANSI/ASME B31.1 or the Addenda and is included for information only.)

It has been agreed to publish Interpretations issued by the B31 Committee concerning B31.1 as part of the subscription service. This supplement includes Interpretations concerning B31.1 issued between January 1, 1983 and June 30, 1983. They have been assigned Interpretation numbers in chronological order. Each Interpretation applies to the latest Edition or Addenda at the time of issuance of the Interpretation. Subsequent revisions to the Code may have superseded the reply.

These replies are taken verbatim from the original letters, except for a few typographical and editorial corrections made for the purpose of improved clarity. In some instances, a review of the Interpretation revealed a need for corrections of a technical nature. In these cases, a revised reply, bearing the original Interpretation Number with the suffix R, is presented.

ASME procedures provide for reconsideration of these Interpretations when or if additional information is available which the inquirer believes might affect the Interpretation. Further, persons aggrieved by an Interpretation may appeal to the cognizant ASME committee or subcommittee. As stated in the Statement of Policy in the Code documents, ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

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B31.1

Subject	Interpretation	File No.[1]
Para. 108.4, Gaskets	3-9	1643
Para. 121.3.2, Integral Type Attachments	3-6	1614
Fig. 127.4.2, Welding End Transitions	3-3	1604
Table 121.1.4, Suggested Pipe Support Spacing	2-14R	1603R*
Table 126.1, Specifications and Standards	3-10	1637
Chilled Water Piping	3-1	1617-1
Gas and Oil Piping in a Steel Mill	3-11	1429
Heating Rates	3-4	1635
Materials Not Listed in Table 126.1	3-5	1494
Pipe Supports	3-8	1497
Postweld Heat Treatment	3-2	1601
Stress Intensities	3-13	1621
Use of Washers	3-7	1646
Weld Preparation and Examination	3-12	1648

[1]Asterisk indicates reply has been revised one or more times.

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Interpretation: 2-14R

Subject: Table 121.1.4, Suggested Pipe Support Spacing

Date Issued: April 20, 1983

File: 1603R

Question: What is the basis for the spans shown in Table 121.1.4 of ANSI/ASME B31.1?

Reply: The spans shown in Table 121.1.4 have been in the Code for many years as a guide to good practice. These spans, when used, generally assure compliance with the criteria in the footnotes. It is the responsibility of the owner to select spans that provide for a safely supported system. The Code is not a handbook, and cannot substitute for education, experience, and sound engineering judgment.

Interpretation: 3-1

Subject: Chilled Water Piping

Date Issued: January 10, 1983

File: 1617-1

Question: Does chilled water piping within a central heating/cooling plant, including its distribution, come under the rules of ANSI/ASME B31.1, or is there a more appropriate ANSI/ASME B31 Code for this piping?

Reply: The rules of ANSI/ASME B31.1 do not apply to the piping described. Other Codes such as, for example, ANSI B31.5, Refrigeration Piping, should be consulted to determine the appropriateness of these Codes for the requirements. If none of these Codes specifically apply, ASME B31 Code Case 137 allows use of any ANSI/ASME piping Code, including ANSI/ASME B31.1. A new ANSI/ASME piping Code, B31.9 Building Services Piping, has been approved and published. ANSI/ASME B31.9 will cover chilled water systems.

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Interpretation: 3-2

Subject: Postweld Heat Treatment

Date Issued: January 13, 1983

File: 1601

Question: What are the postweld heat treatment requirements of ANSI B31.1-1973 for the attachment of nonpressure parts to pressure parts, when both are carbon steel and the joints are "T" joints with full/partial penetration groove welds with fillet reinforcement?

Reply: In accordance with Note (16), Table 131 of ANSI B31.1-1973, all attachment welding of carbon steel nonpressure parts to pressure parts greater than ¾ in. thick, require postweld heat treatment unless the joint meets the exemption requirements of Note (16).

This edition of the Code does not specifically refer to groove-type attachment welds to a pressure retaining part with a wall thickness that does not exceed ¾ in. However, Notes (3) and (4) of Table 131 show the governing factor for postweld heat treatment to be the weld thickness. Therefore, groove-type welds whose thickness (depth of groove and throat of fillet weld) exceeds ¾ in. will require postweld heat treatment.

Interpretation: 3-3

Subject: Figure 127.4.2, Welding End Transitions

Date Issued: February 8, 1983

File: 1604

Question: What is the intent and proper interpretation of ANSI/ASME B31.1 Fig. 127.4.2 requirements as they apply to the minimum and maximum thickness at the end of a component?

Reply: The intent of Fig. 127.4.2 is to provide limits for a transition configuration envelope at the weld end of a thicker component to be buttwelded to a pipe. It does not mandate a particular weld bevel or groove (which is shown for illustration purposes only), nor does it show the maximum permissible weld transition slope required by Para. 127.4.2(C). If necessary, either machining or weld deposition may be used to achieve the required weld transition slope.

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Interpretation: 3-4

Subject: Heating Rates

Date Issued: February 8, 1983

File: 1635

Question: In Note (9) of Table 131 of ANSI B31.1-1977, Summer 1978 Addenda, does the statement "the rate shall be 600°F (315°C) per hr maximum" also mean controlled heating shall start at 600 °F?

Reply: No. Table 131, Notes (9) and (10) of ANSI B31.1-1977, Summer 1978 Addenda, specifies only heating rates which are applicable to the entire heating cycle.

Interpretation: 3-5

Subject: Materials Not Listed in Table 126.1

Date Issued: March 14, 1983

File: 1494

Question: Is it permissible to use a material not listed in Table 126.1 for piping constructed in accordance with ANSI/ASME B31.1?

Reply: Yes, provided that use of the material is not expressly forbidden by the Code and that either condition (a) or condition (b) below is met.

(a) The material is specifically referenced by a Standard listed in Table 126.1 of ANSI/ASME B31.1 and is used in the product form covered by the listed Standard.

(b) The material is used for a component support provided that the requirements of Para. 102.3.1(C) of ANSI/ASME B31.1 are met.

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Interpretation: 3-6

Subject: Paragraph 121.3.2, Integral Type Attachments

Date Issued: March 14, 1983

File: 1614

Question: When pipe supporting elements (per Para. 121 of ANSI/ASME B31.1) include integral type attachments (per Para. 121.3.2), localized stresses must not exceed the allowable stress. Allowable stress is here presumed to include the piping stresses plus support induced stresses. What is the allowable stress: S_h from Appendix A or S_A from Eq. (1) of Para. 102.3.2(C)?

Reply: ANSI/ASME B31.1 does not provide guidance for the calculation of localized stresses and the paragraph reference (121.3.2) is intended to serve as a cautionary note to the responsible designer. The Code provides two allowable stress values (S_h and/or S_A) for the evaluation of stresses in piping components. S_h (Appendix A) is the limit of calculated stress due to sustained loads and S_A [Para. 102.3.2(C)] provides a comparison for the calculated stress range due to cyclic strains. In addition, the use of these limits will likely result in a conservative design and as stated in the Foreword to the Code, "a designer who is capable of a more rigorous analysis. . . . etc."

Interpretation: 3-7

Subject: Use of Washers

Date Issued: March 18, 1983

File: 1646

Question: May 1/16 in. thick washers be placed on the bolts between the faces of a Class 150 steel raised face flange and a Class 125 cast iron flat faced flange to ensure that stress concentrations in the cast iron flange will not reach levels where damage could potentially occur?

Reply: No. The use of washers does not correct the noncompliance with ANSI/ASME B31.1-1977, Para. 108.3 and Table 108.5.2.

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Interpretation: 3-8

Subject: Pipe Supports

Date Issued: March 22, 1983

File: 1497

Question (1): May steel forgings complying with ASTM A 668 be used for pipe supporting elements required to meet the requirements of ANSI/ASME B31.1?

Reply (1): Yes.

Question (2): If use of ASTM A 668 is permissible, how should the allowable stress for this material be determined?

Reply (2): The allowable stress for ASTM A 668 should be determined in accordance with the rules of Para. 102.3.1(C) of ANSI/ASME B31.1.

Interpretation: 3-9

Subject: Paragraph 108.4, Gaskets

Date Issued: March 28, 1983

File: 1643

Question: Does Para. 108.4 of ANSI/ASME B31.1 prohibit the use of compressed asbestos gaskets for pressure below 720 psi (4950 kPa) and temperature below 750°F (400°C) provided the material is compatible with the fluid?

Reply: No.

Interpretation: 3-10

Subject: Table 126.1, Specifications and Standards

Date Issued: May 19, 1983

File: 1637

Question: ANSI B16.15-1978 is listed in Table 126.1 of ANSI/ASME B31.1. ASTM B 584 is not listed in Table 126.1 but is referenced in ANSI B16.15. Is it permissible to use fittings manufactured in accordance with ANSI B16.15-1978 using ASTM B 584 material for construction of piping in accordance with ANSI/ASME B31.1?

Reply: Yes. A material referenced in a Standard listed in Table 126.1 may be used in the product form covered by the listed Standard, provided that use of the material is not expressly forbidden by the Code.

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Interpretation: 3-11

Subject: Gas and Oil Piping in a Steel Mill

Date Issued: May 31, 1983

File: 1429

Question (1): In an industrial plant such as a steel mill, is the gas and oil piping within the plant covered by Para. 100.1.2(C) of ANSI/ASME B31.1?

Reply (1): No, unless the gas and oil piping is associated with a power generating facility with the steel mill.

Question (2): If gas and oil piping in a steel mill is covered by Para. 100.1.2(C), how does one interpret Para. 100.1.3(A)?

Reply (2): Paragraph 100.1.3(A) is to be interpreted as follows: If the oil and gas piping is not associated with a power generating facility within the steel mill, the rules of ANSI/ASME B31.1 do not apply. In this case, codes such as B31.4 Liquid Petroleum Transportation Piping Systems or ANSI Z223.7 Fuel Gas Piping Systems, should be consulted. If none of these, or other codes, apply to this ANSI/ASME B31.1 excluded piping, ASME B31 Code Case 137, which allows use of the rules of any ANSI/ASME B31 code including ANSI/ASME B31.1, may be applied.

Question (3): Is a steel mill defined as a power plant in Para. 100.1.3(A)?

Reply (3): No.

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Interpretation: 3-12

Subject: Weld Preparation and Examination

Date Issued: June 2, 1983

File: 1648

Question (1): What is the intent and correct interpretation of Para. 127.3.1(C) of ANSI/ASME B31.1 in regard to mismatch of internal surfaces?

Reply (1): It is the intent of Para. 127.3.1(C) that the internal misalignment of adjacent piping components to be buttwelded shall be limited to 1/16 in. (2.0 mm) or less.

Question (2): Does Para. 127.3.1(C) invoke specific requirements for end preparation before welding?

Reply (2): No.

Question (3): Does Para. 127.3.1(C) invoke specific requirements for actual weld configurations?

Reply (3): No.

Question (4): Does the requirement for gradual changes in density of the radiograph as set forth in Para. 127.4.2(D.5) apply to concavity and protrusion of weld material into the inside diameter?

Reply (4): Gradual changes in density of the radiograph apply to concavity.

Question (5): Can allowance be given for accepting welds whose radiographs have abrupt density changes when ridges/protrusions are known to be present?

Reply (5): The acceptance standards for radiographs are set forth in Para. 136.4.5(A). The Committee cannot provide an interpretation of radiographic film exposures.

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Interpretation: 3-13

Subject: Stress Intensities

Date Issued: June 6, 1983

File: 1621

Question: How can computed stress intensities which are calculated for compliance with the maximum allowable values in the ASME Boiler and Pressure Vessel Code, Section III, be related to the ANSI/ASME B31.1 maximum allowable stress values in tension?

Reply: ANSI/ASME B31.1 does not introduce the concept of stress intensities. B31.1 allows the designer to perform a detailed stress analysis, but does not provide rules for the performance or an acceptance criteria for detailed analysis. The paragraph reference (121.3.2) is intended to serve as a cautionary note to the responsible designer. The Code provides two allowable stress values (S_h and/or S_A), for the evaluation of stresses in piping components. The use of these limits, in the evaluation of localized stresses induced into the piping component by integral attachments, will likely result in a conservative design. However, the following two references may be useful:

(a) The "Criteria of the ASME Boiler and Pressure Vessel Code for Design by Analysis in Sections III and VIII, Division 2," 1969;

(b) "Piping — Flexibility Analysis" A.R.C. Markl, ASME Transactions, 1955.

The application of such references is acceptable as noted in the Foreword to ANSI/ASME B31.1.

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Interpretations No. 2 to ANSI/ASME B31.1

(This supplement is not part of ANSI/ASME B31.1. It is included for information only.)

It has been agreed to publish Interpretations issued by the B31 Committee concerning B31.1 as part of the subscription service. This supplement includes Interpretations concerning B31.1 issued between July 1, 1982, and December 31, 1982. They have been assigned Interpretation numbers in chronological order. Each Interpretation applies to the latest Edition or Addenda at the time of issuance of the Interpretation. Subsequent revisions to the Code may have superseded the reply.

These replies are taken verbatim from the original letters, except for a few typographical and editorial corrections made for the purpose of improved clarity. In some instances, a review of the Interpretation revealed a need for corrections of a technical nature. In these cases, a revised reply, bearing the original Interpretation Number with the suffix R, is presented.

ASME procedures provide for reconsideration of these Interpretations when or if additional information is available which the inquirer believes might affect the Interpretation. Further, persons aggrieved by an Interpretation may appeal to the cognizant ASME committee or subcommittee. As stated in the Statement of Policy in the Code documents, ASME does not "approve," "certify," "rate," or "endorse" *any item, construction, proprietary device, or activity.*

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B31.1

Subject	Interpretation	File No.[1]
102.3.1 Allowable Stress Values	2-15	1519, 1546
104.8.3 Thermal Expansion Stress Range	2-7	1572
117.2, Soft Soldered Socket-Type Joints	2-9	1575
121.1 Design of Pipe Supporting Elements	2-16	1581
Table 121.1.4 Suggested Pipe Support Spacing	2-14	1603
Fig. 127.4.2 Welding End Transitions	2-6	1611
Fig. 127.4.2 Welding End Transitions	2-6R	1611R*
127.4.8 Welded Branch Connections	2-8	1610
127.5.2 and 127.5.3(B), Welding Responsibility	2-5	1605
127.6 Qualification Records	2-2	1590
136 Examination and Inspection	2-13	1608
Table 136.4, Mandatory Minimum Nondestructive Examination	2-3	1524
Table 136.4, Mandatory Minimum Nondestructive Examination	2-11	1618
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Appendix II Nonmandatory Rules for the Design of Safety Valve Installations	2-10	1573
Piping Supports	2-12	1545
Postweld Heat Treatment	2-4	1586

[1]Asterisk indicates reply has been revised one or more times.

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Interpretation: 2-1

Subject: 137, Leak Testing

Dated Issued: July 2, 1982

File: 1584

Question: For systems containing joints which have been satisfactorily leak tested (pneumatic or hydrostatic) and the threaded joints subsequently seal welded, is it necessary to retest the system?

Reply: No, provided the provisions of 137.1.2(D)(1) through (4) are met.

Interpretation: 2-2

Subject: 127.6 Qualification Records

Date Issued: July 19, 1982

File: 1590

Question: Is it a requirement that weld joints, such as support to building structures, etc., be identified to the welder or welding operator as required in 127.6?

Reply: It is the opinion of the Committee that the intent of 127.6 is to have the welder's identification symbol(s) applied or recorded for all welds between or to pressure retaining piping. The extension of this requirement for welds other than on pressure retaining piping systems is neither required nor prohibited by this Code.

Interpretation: 2-3

Subject: Table 136.4, Mandatory Minimum Nondestructive Examination

Date Issued: July 22, 1982

File: 1524

Question: For welds that require only visual examination in accordance with Table 136.4 and the root of the weld is not accessible for visual examination, are such welds acceptable when radiography is performed and the results of the radiography indicate incomplete penetration?

Reply: No. Such welds are not acceptable. 127.4.2(A) requires girth butt welds to be full penetration welds. Welds not requiring radiography by Table 136.4 and subsequently radiographed shall have the radiograph evaluated for root penetration.

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Interpretation: 2-4

Subject: Postweld Heat Treatment

Date Issued: July 29, 1982

File: 1586

Question (1): When a structural attachment, carbon steel (P-No. 1) 2 in. thick, using a full penetration weld, is welded to a pressure part which is 10 in. schedule 40 carbon steel (P-No. 1), is postheat treatment required?

Reply (1): The weld, as described above, must receive a postweld heat treatment since it does not meet the postweld heat treatment exemption requirements for attachment welding in Note (16) of Table 131.

Question (2): If the answer to Question (1) is yes, what time at temperature would be required?

Reply (2): It is the opinion of the Committee that the weld should receive a postweld heat treatment at 1100–1200°F for a minimum of 2 hr. The effect of a 2 in. thick weld on a 0.365 in. thick pressure part, with a subsequent heat treating operation, must be a design consideration when specifying an arrangement such as this.

Interpretation: 2-5

Subject: 127.5.2 and 127.5.3(B), Welding Responsibility

Date Issued: September 7, 1982

File: 1605

Question (1): Is it permissible to use welders who are not employed by the Certificate Holder to weld boiler external piping (i.e., "PP" piping)?

Reply (1): No. Welders who are not employed by the Certificate Holder may not be used to weld boiler external piping (i.e., "PP" piping).

Question (2): Is there a specific paragraph or Code Case which speaks to this issue?

Reply (2): This issue is covered by 127.5.2 and 127.5.3(B).

Question (3): If it is not presently allowed, what action must be taken to get it evaluated?

Reply (3): Your letter of inquiry to the Committee was the correct action. The Committee has evaluated your questions and has decided that no change to the Code is being considered at this time that would permit the use of welders for this work who were not in the employ of the Certificate Holder.

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Interpretation: 2-6

Subject: Fig. 127.4.2 Welding End Transitions

Date Issued: September 16, 1982

File: 1611

Question (1): Is it the case that for welding purposes, the t nominal dimension and the outside diameter of a component are established by the weld bevel as depicted in Fig. 127.4.2, and the 30 deg. taper shown on the sketch is considered part of the component, not part of the weld bevel?

Reply (1): Yes.

Question (2): Is it the case that if the piping has a larger diameter than the component, and the the diameter differences are within the minimum–maximum tolerance stated in Fig. 127.4.2, weld metal shall be deposited to achieve a gradual transition not exceeding a slope of 1:3 in the weld between the two surfaces?

Reply (2): Yes, provided that the final joint configuration conforms to the tapered transition requirements of Table D-1 of Appendix D.

Interpretation: 2-6R

Subject: Fig. 127.4.2 Welding End Transitions

Date Issued: December 10, 1982

File: 1611R

Question (1): Is it the case that for welding purposes, the t nominal dimension and the outside diameter of a component are established by the weld bevel as depicted in Fig. 127.4.2 of ANSI/ASME B31.1-1980, and the 30 deg. taper shown on the sketch is considered part of the component, not part of the weld bevel?

Reply (1): Yes.

Question (2): Is it the case that if the piping has a larger diameter than the component, and the diameter differences are within the minimum–maximum tolerance stated in Fig. 127.4.2, weld metal shall be deposited to achieve a gradual transition not exceeding 1:3 in the weld between the two surfaces?

Reply (2): Yes; however, the intent of the Code is to avoid abrupt transition between components of unequal outside diameters. Therefore, the exterior surfaces of the weld and the component shall intersect at an included angle not less than 150 deg.

The Committee is considering adding a clarification of the weld transition slope requirements to the Code. Copies of *Mechanical Engineering* should be consulted for announcements of approved Code changes.

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Interpretation: 2-7

Subject: 104.8.3 Thermal Expansion Stress Range

Date Issued: October 4, 1982

File: 1572

Question (1): Is the S_A value to be used in 104.8.3(A) [Eq. (13)] obtained from 102.3.2(C) [Eq. (1)] and from no other location?

Question (2): Does 104.8.3(B) [Eq. (14)] represent the numerical manifestation of the test of 102.3.2(D), first paragraph? That is, does the $(S_h + S_A)$ right-hand side of Eq. (14) correspond to 102.3.2(D) permitting an addition to the allowable stress range amounting to $S_h - S$(sustained)?

Question (3): If the answer to Question (2) above is yes, then must one reduce the S_h term in 104.8.3(B) [Eq. (14)] according to the cyclic reduction factor f identified in Table 102.3.2(C)?

Reply: The answer to all three of your questions is yes. It is the intent of the Code that the term S_A, when used in Eqs. (13) and (14), be calculated per Eq. (1) [102.3.2(C)]. The Code in 102.3.2(D) allows a greater stress range for thermal expansion when the stresses due to sustained loads are small. Equation (14) defines how this is done.

Interpretation: 2-8

Subject: 127.4.8 Welded Branch Connections

Date Issued: October 4, 1982

File: 1610

Question: Should the ¼ in. minimum referenced in Fig. 127.4.8(E) be applied to the minimum leg as opposed to the minimum throat size?

Reply: The sizing of the fillet weld is based on its throat thickness. The minimum fillet throat thickness can be sized as the smaller of ¼ in. or $0.7t_b$ as permitted by 127.4.8(C).

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Interpretation: 2-9

Subject: 117.2, Soft Soldered Socket-Type Joints

Date Issued: October 5, 1982

File: 1575

Question: What "specified pressure–temperature ratings" referenced in 117.2 apply to "soft soldered socket-type joints"?

Reply: The pressure–temperature ratings for soft-soldered socket-type joints are listed in ANSI B16.18 and B16.22, both of which are referenced in Appendix F.

Interpretation: 2-10

Subject: Appendix II Nonmandatory Rules for the Design of Safety Valve Installations

Date Issued: November 16, 1982

File: 1573

Question: In Appendix II, what gas parameters a and b are to be used for dry air and Freon 114 in the equation:

$$P_1 = \frac{W_1}{A_1} \frac{(b - 1)}{b} \sqrt{\frac{2 (h_o - a)J}{g_c (2b - 1)}}$$

Reply: The equation in question is based on an empirical formula relating energy and steam properties near the saturation region. It would not be appropriate to use for dry air or Freon 114.

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Interpretation: 2-11

Subject: Table 136.4, Mandatory Minimum Nondestructive Examination

Date Issued: November 16, 1982

File: 1618

Question: Table 136.4 contains the following category heading:

Temperatures Between 350°F (175°C) and 750°F (400°C)
Inclusive With All Pressures Over 1025 psig (7100 kPag)

Does this mean all temperatures between 350°F (175°C) and 750°F (400°C) regardless of pressure and all pressures above 1025 psig [7100 kPa (gage)] regardless of temperature?

Reply: Both conditions of temperature and pressure must apply. The temperature must be between 350°F (175°C) and 750°F (400°C) with the pressure being greater than 1025 psig [7100 kPa (gage)].

Interpretation: 2-12

Subject: Piping Supports

Date Issued: December 8, 1982

File: 1545

Question: May piping supports designed using materials required by ANSI B31.1 (1973 Edition including 1973 Addenda) with welding design in accordance with MSS-SP-58 (1967) be fabricated and installed in accordance with AWS D1.1 Structural Welding Code using welding procedures and welders qualified to AWS D1.1?

Reply: Yes, except that attachments welded directly to the surfaces of the pressure boundary material must comply with the applicable edition of B31.1.

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Interpretation: 2-13

Subject: Para. 136 Examination and Inspection

Date Issued: December 13, 1982

File: 1608

Question (1): 136.1 distinguishes between examination and inspection, with inspection being the responsibility of the Owner. Does this mean that examination is the responsibility of the fabricator?

Reply (1): Yes, the fabricator or erector is to do the actual examination. The Owner, or his agent, has the responsibility to verify that the examination was performed in accordance with the Code and contract.

Question (2): If the answer to Question (1) is yes, can the visual examination of weldments be performed by the fabricator's welders?

Reply (2): Yes, provided that he has been qualified and certified in accordance with ANSI/ASME B31.1

Question (3): 136.1(A) through (E) gives the training program for the qualification of nondestructive personnel in accordance with the Owner's (or his agent's) program. Can the fabricator invoke this training program on his own as an alternative to AWS QC1 for the qualification of visual examination personnel?

Reply (3): Yes, provided that he has the Owners' approval and that the program complies with the requirements of ANSI/ASME B31.1.

Question (4): Table 136.4 gives the mandatory minimum nondestructive examination requirements for pressure welds or welds to pressure retaining components. Are there documentation requirements for different types of NDE (including visual inspection)? If so, where is it required?

Reply (4): The Code does not have specific documentation requirements for the different types of NDE, except for:

(a) the maintenance of qualification and certification records of the NDE personnel and the procedures used in 136.1;

(b) documentation required by a referenced specification, such as T-292, Article 2 of the ASME Boiler and Pressure Vessel Code, Section V, which requires that a Radiographic Review Form be prepared to record the interpretation of each radiograph and the disposition of examined material.

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Interpretation: 2-14

Subject: Table 121.1.4 Suggested Pipe Support Spacing

Date Issued: December 14, 1982

File: 1603

Question: What is the basis for the spans shown in Table 121.1.4?

Reply: The spans shown in Table 121.1.4 have been in the Code for many years as a guide to good practice. These spans, when used, generally assure compliance with the criteria in the footnotes.

Interpretation: 2-15

Subject: 102.3.1, Allowable Stress Values

Date Issued: December 16, 1982

File: 1519, 1546

Question (1): What is the meaning of the words "an approved ASTM Specification" in 102.3.1(D)?

Reply (1): The meaning of "an approved ASTM Specification" is one which is listed either in Table 126.1 or in a B31 Code Case referring to ANSI/ASME B31.1.

Question (2): What rules of ANSI/ASME B31.1 should be used to determine the allowable stresses for materials used for pipe supporting elements?

Reply (2): For materials which are listed in Table 126.1, the rules of 102.3.1(A) or 102.3.1(D) apply. For materials which are not listed in Table 126.1, the rules of 102.3.1(C) apply. It should be noted that the rules of 121.1.2 also apply to the allowable stresses for materials used for pipe supporting elements. Under certain conditions, the rules of 121.1.2 permit increases and require decreases of the allowable stresses determined in accordance with the rules of 102.3.1(A), 102.3.1(C), and 102.3.1(D).

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Interpretation: 2-16

Subject: 121.1 Design for Pipe Supporting Elements

Date Issued: December 28, 1982

File: 1581

Question (1): Does the term "threaded members" in 121.1.2(A) imply manufactured mass-produced bolts, such as those listed in Table 126.1?

Reply (1): No.

Question (2): What are the inspection requirements for welds in pipe support assemblies?

Reply (2): ANSI/ASME B31.1 has no requirements for inspection of welds in pipe support assemblies other than what is shown in MSS-SP-58.

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Cases
Code for Pressure Piping — B31.1

(The Cases are not part of ANSI/ASME B31.1 or the Addenda and are included for information only.)

A "Case" is the official method of handling a reply to an Inquiry when study indicates that the Code wording needs clarification, or when the reply modifies the existing requirements of the Code, or grants permission to use new materials or alternate constructions.

It has been agreed to publish Cases issued by the B31 Committee concerning B31.1 as part of the subscription service to B31.1. Following this title sheet are all of the currently active Code Cases concerning B31.1. They include:

119
120
129
131
132
133
136
137
139

The text of proposed new and revised Cases will appear in *Mechanical Engineering* for public review. A notice will also appear in *Mechanical Engineering* when new and revised Cases are approved. The Cases will then appear with the next regularly scheduled Addenda to B31.1.

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CASE 119
January 1976

This case shall expire on December 31, 1986, unless previously annulled or reaffirmed.

CASES
CODE FOR PRESSURE PIPING – B31.1

Case 119–Aluminum Bronze Seamless Pipe

Inquiry: May aluminum bronze seamless pipe conforming to the chemistry of alloy CA 614 to ASTM B 169-74 and manufactured to the requirements of ASTM B 315-75 be used for ANSI B31.1 construction? What allowable stress values may be used?

Reply: It is the opinion of the Committee for B31.1, Power Piping, that aluminum bronze seamless pipe conforming to the chemical and mechanical property requirements of alloy CA 614 of ASTM B 169-74 and manufactured to the requirements of ASTM B 315-75 may be used for ANSI B 31.1 construction provided the following additional requirements are met:

(1) The maximum allowable stress values shall be those listed in Table 1.

(2) The material shall be marked with this code case number.

Table 1: Maximum Allowable Stress Values

Metal Temperature Not Exceeding Degrees F	Maximum Allowable Stress Values ksi
100	16.2
150	16.2
200	16.2
250	16.2
300	16.2
350	16.2
400	15.9
450	15.3
500	14.7

NOTES:

1. THIS MATERIAL IS NOT ACCEPTABLE FOR USE ON BOILER EXTERNAL PIPING.

2. This material shall not be used at temperatures in excess of the maximum temperature for which the allowable stresses are indicated.

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This case shall expire on December 31, 1986, unless previously annulled or reaffirmed.

CASE 120
January 1976

CASES
CODE FOR PRESSURE PIPING – B31.1

Case 120—Electric-Fusion-Welded Aluminum Bronze Pipe

Inquiry: May electric-fusion-welded aluminum bronze pipe conforming to the chemical and mechanical requirements of alloy CA 614 of ASTM B 169-74 be used for construction of ANSI B31.1 piping components? What allowable stress values may be used?

Reply: It is the opinion of the Committee for B31.1, Power Piping, that electric-fusion welded pipe conforming to ASTM B 169-74 alloy CA 614 and B 467-74A except as modified herein may be used in the manufacture and fabrication of ANSI B31.1 piping components provided the following requirements are met:

(1) The maximum design pressure shall not exceed 250 psig and the maximum service temperature shall not exceed 200 degrees F. (These limitations are arbitrary for this case with no intent to establish a precedent in regards to these limitations.)

(2) The maximum allowable stress value shall be 17.5 ksi up to and including 200 degrees F Temperature. A joint efficiency factor of 0.80 shall be applied to non-radiographed joints and a factor of 1.00 may be applied to 100% radiographed joints.

(3) The welds shall be made by an electric fusion welding process involving deposition of filler metal. Longitudinal and girth joints shall be full penetration butt welds conforming to paragraphs 127.4.2, 127.4.3, and 127.4.11.

(4) Welding procedures, welding operators, and welders shall be qualified in accordance with Section IX of the ASME Boiler and Pressure Vessel Code. The P-No designation shall be 35.

(5) Welding filler metal shall conform to AWS A5.6-69 (R-CUAL-A2 or E-CUAL-A2).

(6) Radiographic examination, if performed, shall be in accordance with paragraph 136.4.5.

(7) The Chemical composition of the plate, sheet or strip shall conform to the requirements of ASTM B 169-74 Alloy CA 614. The ladle analysis of each heat and a check analysis of each heat or lot of 500 feet or fraction thereof shall be reported.

(8) The plate, sheet, or strip shall conform to the tensile requirements of ASTM B 169-74, Alloy CA 614.

(9) Transverse tension tests taken across the welded joint shall meet the same minimum tensile requirements as the body material. One test shall be made to represent each lot of pipe. (A lot is defined in No. 7 above.)

(10) Two transverse guided weld bend tests or one flattening test shall be made

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CASES
CODE FOR PRESSURE PIPING – B31.1

for each lot as defined in No. 7, above. Guided bend tests for wall thickness less than 3/4 inch shall be one face and one root bend except side bends may be substituted for wall thicknesses over 3/8 inch but less than 3/4 inch. Above 3/4 inch wall, side bends shall be used. The bend test shall be acceptable based on criteria established in Section IX of the ASME Boiler and Pressure Vessel Code. The flattening test, if performed, shall be conducted in accordance with ASTM B 467-71.

(11) Tolerances on wall thicknesses shall conform to the tolerances specified in ASTM B 248-74A, Table 2.

(12) This material is not acceptable for use on boiler external piping.

(13) This material shall not be used at temperatures in excess of the maximum temperature for which the allowable stresses are indicated.

(14) Permissible variations in outside diameter as determined by circumference shall not exceed the following limits:

Nominal Pipe Size, Inches	Permissible Variations in Outside Diameter	
	Over (in.)	Under (in.)
To 4 incl.	1/32	1/32
Over 4 to 8 incl.	1/16	1/32
Over 8 to 18 incl.	3/32	1/32
Over 18 to 30 incl.	1/8	1/32
Over 30	3/16	1/32

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CASE 129
December 1977

This case shall expire on December 31, 1986, unless previously annulled or reaffirmed.

CASES
CODE FOR PRESSURE PIPING – B31.1

Case 129 – Pressure-Temperature Ratings for Ductile (Nodular) Iron Components

Inquiry: May the pressure-temperature ratings and the mandatory hydrostatic shell test pressures tabulated in ANSI B31.1-1977 Edition be adjusted to be compatible with the pressure-temperature ratings and the mandatory hydrostatic shell test pressures shown in ANSI B16.5-1977?

Reply: Pending revision to the Code, it is the opinion of the Committee that the pressure-temperature ratings and the mandatory hydrostatic shell test pressures tabulated below may be used in lieu of those shown in ANSI B31.1-1977 Edition except that the following limitations apply for the use of ductile (nodular) iron components in Boiler External Piping:

1. Only ASME SA-395 material shall be used.
2. The design pressure shall not exceed 350 psig.
3. The design temperature shall not exceed 450°F.

Pressure Temperature Ratings for Ductile (Nodular) Iron Components Manufactured in Compliance with the Dimension in ANSI B16.1 and ANSI B16.5

Service Temperature Deg. F	Pressure, psi					
	Class 125	Class 250	Class 150	Class 300	Class 400	Class 600
	ANSI B16.1		ANSI B16.5			
-20 to 100	228	592	228	592	792	1184
200	208	540	208	540	720	1080
300	184	524	184	524	700	1052
400	160	508	160	508	676	1016
500	136	480	136	480	640	960
600	112	440	112	440	584	876
650	100	428	100	428	572	860
Mandatory Hydrostatic Shell Test Pressure	450	1125	450	1125	1500	2225

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CASE 131
November 1978

This case shall expire on December 31, 1986, unless previously annulled or reaffirmed.

CASES
CODE FOR PRESSURE PIPING – B31.1

Case 131 – Use of ASTM B283, Alloy 377 Forgings

Inquiry: May copper alloy forgings conforming to ASTM B283, Alloy 377 be used for ANSI B31.1 construction and what allowable stress values may be used?

Reply: Pending a revision to the Code, it is the opinion of the Committee for B31.1 Power Piping that Copper Alloy No. 377 forgings conforming to the requirements of ASTM B283-77 are acceptable for ANSI B31.1 construction providing the following exceptions and requirements are satisfied.

1. The temperature shall not exceed 200°F.
2. Materials shall not be welded.
3. Material is not acceptable for use in Boiler External Piping.
4. Markings on valves manufactured from this material shall include the material specifications and type and code case number.
5. All other requirements of ASTM B283-77 and ANSI B31.1-1977 Edition shall be met.
6. The maximum allowable stress values shall be those listed below:

Maximum Allowable Stress in Thousands of Pounds Per Square Inch

Temperature, °F	Up to 1½ in.	Over 1½ in.
100	11.0	9.8
150	10.8	9.5
200	10.5	9.2

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CASE 132
May 1979

This case shall expire on December 31, 1986, unless previously annulled or reaffirmed.

CASES
CODE FOR PRESSURE PIPING – B31.1

Case 132 – Overpressurization of Valves.

Inquiry: Paragraph 107.1, C of ANSI B31.1-1977 discusses liquid trapped in a valve and subsequently heated, thereby causing increase in pressure of the entrapped fluid. Does this paragraph apply only to gate valves having pressure seal bonnets and flexible wedges, and having the stems horizontal?

Reply: It is the opinion of the Committee that the requirements of Paragraph 107.1, C apply to any valve in a piping system which may be subjected to a rise in pressure beyond that which is allowed by the Code.

Paragraph 107.1, C has been included to provide recognition and awareness that a dangerous condition can occur when liquid is trapped in a valve and heat is subsequently applied. In this situation precaution must be taken to prevent excessive pressure build-up: for example, by continuous open passageway between the cavity and the adjoining upstream pipe caused by a hole in the closure member or by a pipe; use of a relief valve; venting the trapped cavity before and during heating (probably by unseating the main disc before heat is applied) or otherwise.

It is the responsibility of the Owner to review the particular project to make a judgment as to where this condition can exist and to provide means to prevent any such overpressurization.

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CASE 133
March 1980

This case shall expire on December 31, 1986, unless previously annulled or reaffirmed.

CASES
CODE FOR PRESSURE PIPING – B31.1

Case 133–Use of ANSI/ASTM A671-77, ANSI/ASTM A672-77 and ANSI/ASTM A691-77 in ANSI/ASME B31.1 Construction.

Inquiry: May electric fusion welded steel pipe conforming to the requirements of ANSI/ASTM A671-77, ANSI/ASTM A672-77 andANSI/ASTM A691-77 be used for ANSI B31.1 construction? What allowable stress values may be used?

Reply: It is the opinion of the Committee that electric fusion welded steel pipe conforming to the requirements of ANSI/ASTM A671-77, ANSI/ASTM A672-77 and ANSI/ASTM A691-77 may be used for ANSI/ASME B31.1 construction provided the following requirements are met:

1. Only those pipe grades for which allowable stress values are provided herein shall be used.
2. Allowable stress values listed herein are for fully radiographed pipe (Classes 11, 12, 21, 22, 31, 32, 41, 42, 51 and 52) only. For non-radiographed pipe (Classes 10, 20, 30, 40 and 50), a weld joint efficiency factor (E) of 0.90 shall be applied to the stress values listed in accordance with Paragraph 104.1.2, A of ANSI/ASME B31.1.
3. For all classes of pipe, each finished length shall be subjected to the hydrostatic test in accordance with ASTM Specification A-530 except that the purchaser, with the agreement of the manufacturer, may complete the hydrostatic test requirement with the system pressure test. Each length of pipe furnished without the completed manufacturers hydrostatic test shall include with the mandatory marking the letters NH.
4. Welded joints for pipe furnished in accordance with ANSI/ASTM A691-77 shall be double welded, full penetration welds made in accordance with the procedures and by welders or welding operators qualified in accordance with ASME Boiler and Pressure Vessel Code Section IX.
5. Material manufactured in accordance with these specifications is not acceptable for use on Boiler External Piping.
6. The term lot, as used in Paragraph 8 of ANSI/ASTM A671, A672 and A691 shall consist of each 200 ft. (61m) or fraction thereof of all pipe of the same mill heat of plate material and wall thickness within ± 1/4 inch (6.4 mm) subjected to the same heat treatment for pipe which is not heat treated or which is heat treated in a continuous furnace. For pipe heat treated in a batch-type furnace, which is automatically controlled within a 50 F (28 C) range and is equipped with recording pyrometers so that heating records are available, a lot shall be defined the same as for continuous furnaces. For pipe heated in a batch-type furnace not equipped with automatic controls or recording pyrometer, a lot shall be defined as all pipe of the same mill heat of plate material

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CASES
CODE FOR PRESSURE PIPING – B31.1

and wall thickness heat treated in one furnace charge.

7. Class 10, 11 and 12 pipe (non-heat treated) may be furnished only in those grades of pipe which are designated as P-No. 1 material and only in wall thickness of 3/4 in. (19 mm) or less.
8. For Classes 20, 21 and 22 pipe, the following additional requirements are mandatory:
   (a) The tempering temperatures applied to plate furnished in the normalized and tempered or quench and tempered condition shall conform to the temperature range specified in ANSI/ASME B31.1 for postweld heat treatment for the P-No. assigned herein for each grade of pipe.
   (b) The postweld heat treatment temperatures applied to the pipe shall not exceed the tempering temperature of plate materials furnished in the normalized and tempered or quench and tempered condition.
9. For Classes 41, 42, 51 and 52 pipe, the tempering temperature shall conform to the temperature range specified in ANSI/ASME B31.1 for the P-No. assigned herein for each grade of pipe.

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Case 133 continues on next page

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CASES
CODE FOR PRESSURE PIPING – B31.1

Material	Specification	'P' No.	Gr. No.	Grade	Class	Tensile Strength Minimum KSI	Notes
ELECTRIC FUSION WELDED PIPE–FILLER METAL ADDED–RADIOGRAPHED							
A285 Gr C	A671	1	1	CA55	11,12,21,22,31,32	55.0	(1)
A515 Gr 60	A671	1	1	CB60	11,12,21,22,31,32	60.0	(1)
A515 Gr 65	A671	1	1	CB65	11,12,21,22,31,32	65.0	(1)
A515 Gr 70	A671	1	2	CB70	11,12,21,22,31,32	70.0	(1)
A516 Gr 60	A671	1	1	CC60	11,12,21,22,31,32	60.0	(1)
A516 Gr 65	A671	1	1	CC65	11,12,21,22,31,32	65.0	(1)
A516 Gr 70	A671	1	2	CC70	11,12,21,22,31,32	70.0	(1)
C-Mn-Si	A671	1	2	CK75	11,12,21,22,31,32	75.0	(1)
C-Mn-Si	A671	1	2	CD70	11,12,21,22,31,32	70.0	(1)(3)
C-Mn-Si	A671	1	3	CD80	11,12,21,22,51,52	80.0	(1)(3)
A285 A	A672	1	1	A45	11,12,21,22,31,32	45.0	(1)
A285 Gr B	A672	1	1	A50	11,12,21,22,31,32	50.0	(1)
A285 Gr C	A672	1	1	A55	11,12,21,22,31,32	55.0	(1)
A515 Gr 55	A672	1	1	B55	11,12,21,22,31,32	55.0	(1)
A515 Gr 60	A672	1	1	B60	11,12,21,22,31,32	60.0	(1)
A515 Gr 65	A672	1	1	B65	11,12,21,22,31,32	65.0	(1)
A515 Gr 70	A672	1	2	B70	11,12,21,22,31,32	70.0	(1)
A516 Gr 55	A672	1	1	C55	11,12,21,22,31,32	55.0	(1)
A516 Gr 60	A672	1	1	C60	11,12,21,22,31,32	60.0	(1)
A516 Gr 65	A672	1	1	C65	11,12,21,22,31,32	65.0	(1)
A516 Gr 70	A672	1	2	C70	11,12,21,22,31,32	70.0	(1)
C-Mn-Si	A672	1	2	D70	11,12,21,22,31,32	70.0	(1)(3)
C-Mn-Si	A672	1	3	D80	11,12,21,22,51,52	80.0	(1)(3)
C-Mn-Si	A672	1	2	N75	11,12,21,22,31,32	75.0	(1)
C-Mn-Si	A691	1	2	CMSH70	11,12,21,22,31,32	70.0	(1)(3)
C-Mn-Si	A691	1	3	CMSH80	11,12,21,22,51,52	80.0	(1)(3)
C-Mn-Si	A691	1	2	CMS75	11,12,21,22,31,32	75.0	(1)

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CASES
CODE FOR PRESSURE PIPING – B31.1

Maximum Allowable Stress Values In Tension In Thousands of Pounds Per Square Inch
For Metal Temperature Not Exceeding Deg. F

−20 to 100	200	300	400	500	600	650	−30 to 650	700	750	800	Specification	Grade
							ELECTRIC FUSION WELDED PIPE—FILLER METAL ADDED—RADIOGRAPHED					
...	...	...	...	...	...	...	13.8	13.3	12.1	10.2	A671	CA55
...	...	...	...	...	...	...	15.0	14.4	13.0	10.8	A671	CB60
...	...	...	...	...	...	...	16.2	15.5	13.9	11.4	A676	CB65
...	...	...	...	...	...	...	17.5	16.6	14.8	12.0	A671	CB70
...	...	...	...	...	...	...	15.0	14.4	13.0	10.8	A671	CC60
...	...	...	...	...	...	...	16.3	15.5	13.9	11.4	A671	CC65
...	...	...	...	...	...	...	17.5	16.6	14.8	12.0	A671	CC70
...	...	...	...	...	...	...	18.8	17.7	15.7	12.0	A671	CK75
17.5	17.5	17.2	17.2	17.2	17.2	17.2	...	...	...	...	A671	CD70
20.0	20.0	20.0	19.8	19.8	19.8	19.7	...	...	...	...	A671	CD80
...	...	...	...	...	...	...	10.2	9.8	8.7	7.5	A672	A45
...	...	...	...	...	...	...	12.5	12.1	11.1	9.4	A672	A50
...	...	...	...	...	...	...	13.8	13.3	12.1	10.2	A672	A55
...	...	...	...	...	...	...	13.8	13.3	12.1	10.2	A672	B55
...	...	...	...	...	...	...	15.0	14.4	13.0	10.8	A672	B60
...	...	...	...	...	...	...	16.2	15.5	13.9	11.4	A672	B65
...	...	...	...	...	...	...	17.5	16.6	14.8	12.0	A672	B70
...	...	...	...	...	...	...	13.8	13.3	12.1	10.2	A672	C55
...	...	...	...	...	...	...	15.0	14.4	13.0	10.8	A672	C60
...	...	...	...	...	...	...	16.3	15.5	13.9	11.4	A672	C65
...	...	...	...	...	...	...	17.5	16.6	14.8	12.0	A672	C70
17.5	17.5	17.2	17.2	17.2	17.2	17.2	...	...	...	...	A672	D70
20.0	20.0	20.0	19.8	19.8	19.8	19.7	...	...	...	...	A672	D80
...	...	...	...	...	...	...	18.8	17.7	15.7	12.0	A672	N75
17.5	17.5	17.2	17.2	17.2	17.2	17.2	...	...	...	...	A691	CMSH70
20.0	20.0	20.0	19.8	19.8	19.8	19.7	...	...	...	...	A691	CMSH80
...	...	...	...	...	...	...	18.8	17.7	15.7	12.0	A691	CM575

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CASES
CODE FOR PRESSURE PIPING – B31.1

Material	Specification	'P' No.	Gr. No.	Grade	Class	Tensile Strength Minimum KSI	Notes
ELECTRIC FUSION WELDED PIPE—FILLER METAL ADDED—RADIOGRAPHED							
C-½ Mo.	A672	3	1	L65	21,22,31,32,41,42	65.0	(1)
C-½ Mo	A672	3	2	L70	21,22,31,32,41,42	70.0	(1)
C-½ Mo	A672	3	2	L75	21,22,31,32,41,42	75.0	(1)
C-½ Mo	A691	3	1	CM65	21,22,31,32,41,42	65.0	(1)
C-½ Mo	A691	3	2	CM70	21,22,31,32,41,42	70.0	(1)
C-½ Mo	A691	3	2	CM75	21,22,31,32,41,42	75.0	(1)
½ Cr-½ Mo	A691	3	1	½ Cr	21,22	55.0	(1)(2)
½ Cr-½ Mo	A691	3	2	½ Cr	21,22,31,32,41,42	70.0	(1)
1 Cr-½ Mo	A691	4	1	1 Cr	21,22	55.0	(1)(2)
1 Cr-½ Mo	A691	4	1	1 Cr	21,22,31,32,41,42	65.0	(1)
1¼ Cr-½ Mo-Si	A691	4	1	1¼ Cr	21,22	60.0	(1)(2)
1¼ Cr-½ Mo	A691	4	1	1¼ Cr	21,22,31,32,41,42	75.0	(1)
2¼ Cr-1 Mo	A691	5	1	2¼ Cr	21,22	60.0	(1)(2)
2¼ Cr-1 Mo	A691	5	1	2¼ Cr	21,22,31,32,41,42	75.0	(1)(4)
3 Cr-1 Mo	A691	5	1	3 Cr	21,22	60.0	(1)(2)
3 Cr-1 Mo	A691	5	1	3 Cr	21,22,31,32,41,42	75.0	(1)
5 Cr-½ Mo	A691	5	2	5 Cr	21,22	60.0	(1)(2)
5 Cr-½ Mo	A691	5	2	5 Cr	21,22,31,32,41,42	75.0	(1)(4)

NOTES:

(1) The allowable stress values given are for a weld efficiency factor (E) of 100.0. For classes which are not radiographed, a weld efficiency factor (E) of 0.90 shall be applied. Refer to ANSI/ASME B31.1, para. 104.

(2) The allowable stress values given are for pipe fabricated from annealed plate.

(3) The allowable stress values given are for pipe fabricated from plate not exceeding 2½ inches in thickness.

(4) At 400F and below, the following allowable stresses shall apply.

	-20 to 100F	200F	300F	400F
2¼ Cr-1 Mo A691 Class 41 & 42	18.8	18.8	18.3	18.0
5 Cr-½ Mo A691 Class 41 & 42	18.7	18.7	17.7	17.7

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CASES
CODE FOR PRESSURE PIPING – B31.1

Maximum Allowable Stress Values In Tension In Thousands of Pounds Per Square Inch For Metal Temperature Not Exceeding Deg. F

–20 to 400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	Specification	Grade
															ELECTRIC FUSION WELDED PIPE–FILLER METAL ADDED–RADIOGRAPHED	
16.3	16.3	16.3	16.3	16.3	16.7	15.8	15.3	...	...	...	...	...	...	...	A672	L65
17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.1	...	...	...	...	...	...	...	A672	L70
18.8	18.8	18.8	18.8	18.8	18.8	18.8	15.3	...	...	...	...	...	...	...	A672	L73
16.3	16.3	16.3	16.3	16.3	16.2	15.8	15.3	...	...	...	...	...	...	...	A691	CM65
17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.1	...	...	...	...	...	...	...	A691	CM70
18.8	18.8	18.8	18.8	18.8	18.8	18.8	15.3	...	...	...	...	...	...	...	A691	CM75
13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.4	12.8	9.2	5.9	...	...	...	...	A691	½ Cr
17.5	17.5	17.5	17.5	17.5	17.5	17.5	16.8	14.5	10.2	6.3	...	...	...	...	A691	½ Cr
13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.4	12.8	11.0	6.6	4.3	2.6	...	...	A691	1 Cr
16.3	16.3	16.3	16.3	16.3	16.3	16.3	15.8	15.1	11.0	6.6	4.3	2.6	...	...	A691	1 Cr
15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.6	13.9	11.0	6.9	4.6	2.6	...	...	A691	1¼ Cr
18.8	18.8	18.8	18.8	18.8	18.8	18.8	16.3	15.9	11.0	6.9	4.6	2.8	...	...	A691	1¼ Cr
15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.4	13.1	11.0	7.8	5.8	4.2	...	...	A691	2¼ Cr
...	17.9	17.8	17.7	17.5	17.2	16.9	16.4	15.8	11.0	7.6	5.8	4.4	...	...	A691	2¼ Cr
15.0	15.0	15.0	15.0	14.8	14.5	13.9	13.2	12.0	9.0	7.0	5.5	4.0	...	...	A691	3 Cr
17.9	17.9	17.8	17.7	17.6	17.2	16.9	16.4	13.0	9.6	6.8	4.9	3.2	...	...	A691	3 Cr
15.0	14.5	14.0	13.7	13.4	13.1	12.8	12.0	10.4	7.6	5.6	4.2	3.1	2.0	1.3	A691	5 Cr
...	17.7	17.7	17.5	17.1	16.7	16.1	15.3	10.3	7.6	5.6	4.2	3.1	2.0	1.3	A691	5 Cr

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CASE 136
April 1981

CASES
CODE FOR PRESSURE PIPING – B31.1

Case 136 – Use of Nickel-Iron-Chromium Alloys 800 and 800H

Inquiry: May nickel-iron-chromium alloys (800 and 800H) seamless condenser and heat exchanger tubes, rods, and bars, seamless pipe and tubes, plate, sheet, and strip, conforming respectively to ASME Specifications SB-163, SB-408, SB-407, and SB-409, be used in ANSI/ASME B31.1 construction?

Reply: It is the opinion of the Committee that nickel-iron-chromium alloy forms as shown in Table I may be used in ANSI/ASME B31.1 construction provided the following requirements and exceptions are satisfied:

1. Material shall not be used in Boiler External Piping.

2. Maximum material temperature shall not exceed 1200°F.

3. The maximum allowable design stress shall not exceed those listed in Table II.

4. Welded fabrication shall conform to the applicable requirements of ANSI/ASME B31.1.

a. The procedure and performance qualifications shall be conducted as prescribed in Section IX of the ASME Boiler and Pressure Vessel Code.

b. Welding shall be done by any welding process or combination of processes capable of meeting the requirements.

c. The use of filler metal that will deposit weld metal with the same composition as the material joined is recommended. When the manufacturer is of the opinion that a better corrosion-resistant joint can be made by departure from these limits, filler metal of a different composition may be used provided the strength of the weld metal at the operating temperature is not less than that of the high-alloy material to be welded, and user is satisfied that its resistance to corrosion is satisfactory for the intended service.

d. Heat treatment after forming or fabrication is neither required nor prohibited.

TABLE I

Form	ASME Specification
Seamless Condenser and Heat Exchanger Tubes	SB-163
Seamless Pipe and Tube	SB-407
Rods and Bars	SB-408
Plate, Sheet and Strip	SB-409

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CASES
CODE FOR PRESSURE PIPING – B31.1

TABLE II

For Metal Temperatures Not Exceeding (°F)	Stress, ksi			
	Alloy 800		Alloy 800H	
100	18.7	18.7[1]	16.2	16.2[1]
200	18.7	18.7	15.4	16.2
300	17.9	18.7	14.5	16.2
400	17.2	18.7	13.5	16.2
500	16.7	18.7	12.9	16.0
600	16.3	18.7	12.2	16.0
650	16.1	18.6	11.9	16.0
700	15.9	18.6	11.7	15.7
750	15.7	18.5	11.4	15.4
800	15.5	18.5	11.1	15.3
850	15.3	18.3	10.9	15.1
900	15.1	18.2	10.7	14.8
950	14.9	17.9	10.5	14.6
1000	14.7	17.6	10.3	14.4
1050	14.5	17.0	10.1	13.7
1100	13.0	13.0	10.0	13.5
1150	9.8	9.8	9.8	11.2
1200	6.6	6.6	8.4	8.4

[1]Due to the relatively low yield strength of these materials, the higher stress values were established at temperatures where the short-time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. These higher stress values exceed 62.5% but do not exceed 90% of their yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction.

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CASE 137
September 1981

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CASES
CODE FOR PRESSURE PIPING – B31.1

Case 137 – **Piping Not Covered by Any ANSI/ASME B31 Code Section**

Inquiry: When no Section of the ASME Code for Pressure Piping, B31, specifically covers a piping system, which Section should be used for materials, design, fabrication, assembly, erection, examination, inspection, and testing of this system?

Reply: At his discretion, the user may select any Section determined to be generally applicable. However, it is cautioned that supplementary requirements to the Section chosen may be necessary to provide for a safe piping system for the intended application. Technical limitations of the various Sections, legal requirements, and possible applicability of other codes or standards are some of the factors to be considered by the user in determining the applicability of any Section of this Code.

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Case 139
July 1982

This case shall expire on December 31, 1986, unless previously annulled or reaffirmed.

CASES
CODE FOR PRESSURE PIPING – B31.1

Case 139 – Rules for the Use of ASME SB-265 and ASME SB-337 Materials in ANSI/ASME B31.1. Construction

Inquiry: What additional rules shall apply to the use of materials conforming to ASME SB-265 and ASME SB-337 for the construction of piping in accordance with ANSI/ASME B31.1?

Reply: The following additional rules shall apply to the use of ASME SB-265 and ASME SB-337 materials for construction of piping in accordance with ANSI/ASME B31.1:

1. The following maximum allowable stress values shall apply to ASME SB-265 material and ASME SB-337 seamless pipe:

Metal Temperature Not Exceeding (°F)	Maximum Allowable Stress Values In Tension (ksi)			
	GR. 1	GR. 2	GR. 3	GR. 7
100	8.8	12.5	16.3	12.5
150	8.1	12.0	15.6	12.0
200	7.3	10.9	14.3	10.9
250	6.5	9.9	13.0	9.9
300	5.8	9.0	11.7	9.0
350	5.2	8.4	10.4	8.4
400	4.8	7.7	9.3	7.7
450	4.5	7.2	8.3	7.2
500	4.1	6.6	7.5	6.6
550	3.6	6.2	6.7	6.2
600	3.1	5.7	6.0	5.7

2. The stress values listed in 1. may be interpolated to determine values for intermediate temperatures.

3. For ASME SB-337 welded pipe and ASME SB-265 material formed into welded pipe, an efficiency factor of 0.85 shall be applied to the allowable stress values listed in 1.

4. Filler metal shall not be used in the manufacture of welded pipe.

5. Pipe shall comply with all the requirements of ASME SB-337, with the exception of dimensional requirements. Pipe dimensions shall comply with the requirements of ANSI B36.19-1976.

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