

# Conduct of Engineering Formal Clarification or Interpretation Request

Assigned by	Responder: Clarification Interpretation	Tracking number	ESM-CIR-2015-005
Clarify	To make the CoE document or its references understandable and free from confusion		
Interpret	To formally provide an acceptable method of compliance wi	th the document or refere	nces

# 1.0 Request

Brief Title:

Affected Document Title, Number, and Rev. No.

Engineering Standards Manual STD-342-100 Chapter 17, Pressure Safety, Revision: 0, 9/17/2014

Section/Article/Para and Existing Wording

Section GEN - General Requirements GENERAL 1.0

A. Introduction and Applicability

5. Throughout this document there are references to specific ASME code paragraphs or sections. For most cases across the Laboratory, the appropriate codes are B31.3 and Section VIII of the Boiler and Pressure Vessel Code. However, the most applicable code must be used for design, fabrication, inspection, and testing; take requirements in this document referring to or taken from B31.3 to mean the corresponding provisions in the applicable B31 code.

## Section ADMIN - Administrative Requirements Rev. 0, 9/17/2014

## ADMIN-2 Design, Documentation, and Records

# Z. Unlisted, Specialty, or Unique Components<sup>25</sup>

1. Unlisted components allowed for new construction must demonstrate equal or greater level of safety at the pressure and temperature of the system. ASME B31.3 requires a safety factor of 3:1 and ASME B31.1 requires a safety factor of 4:1. For existing systems, refer to Chapter 17 Section EXIST.

a. Swagelok components (tubing, fittings, and valves only) are allowed for use in construction of new, codecompliant systems at LANL.<sup>26</sup> See Section Attachment ASME-4-2 for flex hose.

2. The master list of Unlisted Components allowed for use is maintained by the CPSO and made available for both internal and external web access.

3. Components that are not built to the standards listed in the codes -- including those built to other standards, manufacturers' standards, or built by LANL -- must be qualified by the owner and/or the designer (per the code of record) as follows (B31.3 302.2.3):

a. Unlisted Components - (a) Components not listed in Table 326.1, but which conform to a published specification or standard may be used within the following limitations.

1) The designer shall be satisfied that composition, mechanical properties, method of manufacture, and quality control are comparable to the corresponding characteristics of listed components.

2) Pressure design shall be verified in accordance with para. 304:

- 304 PRESSURE DESIGN OF COMPONENTS
  - 304.1 Straight Pipe
  - 304.2 Curved and Mitered Segments of Pipe
  - 304.3 Branch Connections
  - 304.4 Closures
  - 304.5 Pressure Design of Flanges and Blanks
  - 304.6 Reducers
  - 304.7 Pressure Design of Other Components

NOTE: Items that are 304.7.	NOTE: Items that are not evaluated per 304.1, 304.2, 304.3, 304.4, 304.5, or 304.6 MUST BE eva 304.7.					
<ul> <li>3) Other unlisted components shall be qualified for pressure design as required by para. 304.7.2.</li> <li>4) Components built at LANL <ul> <li>a. Require qualification by engineering calculation to support pressure design consistent with the applicable code. Documentation showing compliance with the design criteria of the code approved by the owner shall be by one of the following: <ul> <li>i. Extensive successful service under the same loading and service conditions</li> <li>ii. Experimental stress analysis<sup>27</sup></li> </ul> </li> <li>iii. Proof test (e.g., Sect VIII UG-101 would be 4 times MAWP)</li> <li><i>iv.</i> Detailed stress analysis (such as finite element method)<sup>28</sup></li> </ul></li></ul>						
Inquiry (describe ambiguity or issue	)					
Are ASME Code stamped relief devices B31.9 applications?	s (e.g. UV, HV, SV, etc	) required to be evaluated as u	inlisted items for ASME			
Requestor (LANL employee)	Z Number	Organization	Date			
Ari Ben Swartz	235211	ES-EPD	06/17/2015			
		d				

# 2.0 Response by Safety (or Security) Management Program Owner Representative (SMPOR/POC)

For all pressure systems:

ASME stamped relief devices may be used as listed valves within the service conditions allowed by the manufacturer.

Un-stamped relief devices may be used less than or equal to 15 psig within the service conditions allowed by the manufacturer.

Un-stamped relief devices above 15 psig must be evaluated in accordance with ASME B31.9 904.7.2, Unlisted Components, 907.1.2 Unlisted Valves., and the requirements of 922, Design Requirements Pertaining to Specific Piping Systems.

Attachment:

• Justification/Compensatory Measures (4 pages)

Name	Z Number	Signature	Date
Ari Ben Swartz	235211	(in Sendwarts	6/17/2015

## 3.0 SMPO Approval (Standards Manual and code and regulation matters only, otherwise N/A)

Comments			
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Distribution: Requestor, SMPOR, SMPO, CENG-OFF Program POC

#### Justification/Compensatory Measures

The ASME B31 piping codes address relief devices differently. ASME B31.1 requires the devices meet ASME Boiler and Pressure Vessel Code (B&PVC) Section I *Rules for Construction of Power Boilers*, and Section VIII Division 1, *Rules for Construction of Pressure Vessels*.

The ASME B31.9-2014 requires listed components, gives methods to use unlisted valves, and allows the use of components from ASME B31.1.

902.2 Pressure-Temperature Design Criteria for Piping Components

902.2.1 Components Having Specific Ratings

(a) For Listed Components. Pressure-temperature ratings have been established for certain piping components and are contained in some of the standards listed in Table 926.1. These ratings are accepted for use in accordance with this Code.

(b) For Components Not Listed. If it is necessary to use components that do not conform to standards listed in Table 926.1, they shall be qualified for pressure design in accordance with the requirements of **para. 904.** In addition, they shall be used within the ratings and other service limitations given by the manufacturer.

904.7.2 Unlisted Components. Pressure containing components made of listed materials but not made in accordance with a specification or standard listed in Table 926.1 or Mandatory Appendix I shall be substantiated by at least one of the following:

(a) engineering calculations

(b) experimental stress analysis such as described in Part 5 in Section VIII, Division 2 of the ASME BPV Code

(c) proof test in accordance with UG-101 in Section VIII, Division 1 of the ASME BPV Code If differences in size and proportion are small, components may be designed by interpolation between similar configurations that have been proven by one of the procedures described above, or that conform to a listed standard.

### 907 VALVES

907.1 General

907.1.2 Unlisted Valves. Valves not manufactured in accordance with a listed standard shall be used only within the manufacturer's recommendations as to service and ratings, and within the limitations on comparable listed valves, considering composition, mechanical properties, dimensions, method of manufacture, and quality control. Otherwise, the valves shall be qualified in accordance with para. 904.7.2.

926 DIMENSIONS AND RATINGS OF COMPONENTS

926.1 Standard Piping Components Standard piping components shall conform to one of the standards or specifications listed in Table 926.1. Those listed in ASME B31.1 may also be used.

The ASME B31.9 allows ASME B31.1 listed items, and allows valves to be used in accordance with 904.1.2.

The ASME quality marking program for relief devices is utilized as an industrial standard to ensure that a relief device functions properly at the correct temperature and pressure and relieves the rated quantity over time. The ASME B31.1 committees recognize the value of utilizing a marked relief device as the main over pressure protection device.

The ASME B31.1 requires the use of ASME marked valves for steam and non-steam applications as follows:

B31.1-2014 POWER PIPING Chapter I Scope and Definitions 100.1.2

The valve or valves required by para. 122.1 are part of the boiler external piping, but do not require ASME Boiler and Pressure Vessel Code, Section I inspection and stamping except for safety, safety relief, and relief valves; see para. 107.8.2. Refer to PG-11.

107.8.2 Pressure-Relieving Valves on Boiler External Piping. Safety, safety-relief, and power-actuated pressure-relieving valves on boiler external piping shall be in accordance with para. 122.1.7(D.1) of this Code.

107.8.3 Pressure Relief Requirements on Nonboiler External Piping

(A) Reheater safety valves on reheat piping shall conform to para. 122.1.7(D.1).

(B) Safety, safety-relief, relief, and pilot-operated pressure relief valves shall be in accordance with UG-126 of ASME Boiler and Pressure Vessel Code, Section VIII, Division 1.

(C) Nonreclosing pressure relief devices, such as rupture disks, pin devices/valves, and spring-loaded nonreclosing devices shall be in accordance with UG-127 of Section VIII, Division 1.

(D) Valves and devices in (B) and (C) above shall be constructed, manufactured, rated, and marked in accordance with the requirements of UG-128 through UG-132 and UG-136 through UG-138 of Section VIII, Division 1.

(E) An ASME Code Stamp and capacity certification are not required for valves with set pressures 15 psig [100 kPa (gage)] and lower.

2013 ASME Boiler and Pressure Vessel Code Section VIII, Rules for Construction of Pressure Vessels, Division 1

### **UG-129 MARKING**

(a) Safety, Safety Relief, Relief, Liquid Pressure Relief, and Pilot Operated Pressure Relief Valves. Each safety, safety relief, relief, liquid pressure relief, and pilot operated pressure relief valve NPS 1/2 (DN 15) and larger shall be plainly marked by the Manufacturer or Assembler with the required data in such a way that the marking will not be obliterated in service. The marking may be placed on the valve or on a metal plate or plates securely fastened to the valve.

Note UG-129 continues to the sections that specify the marking requirements for example:

(7) the Certification Mark with the UV Designator placed under the Mark, as shown in Figure UG-129.1. A marking method other than the stamp issued by the Society may be used provided it is acceptable to the ASME designated organization.



#### **UG-130 CERTIFICATION MARK**

Each pressure relief device<sup>59</sup> to which the Certification Mark with the appropriate Designator (see Figures UG-129.1 and UG-129.2) will be applied shall have been fabricated or assembled by a Manufacturer or Assembler holding a valid Certificate of Authorization (UG-117) and capacity certified in accordance with the requirements of this Division. A Certified Individual (CI) shall provide oversight as required by UG-117(a). Each use of the Certification Mark with the appropriate Designator shall also be documented on a Certificate of Conformance Form UV-1 or UD-1, as appropriate.

122.1.7 Valves and Fittings

(D) Pressure-Relieving Valves

(D.1) Safety, safety-relief, and power-actuated pressure-relieving valves shall conform to the requirements of PG-67, PG-68, PG-69, PG-70, PG-71, PG-72, and PG-73 of Section I of the ASME Boiler and Pressure Vessel Code.

PG-69 CERTIFICATION OF CAPACITY OF PRESSURE RELIEF VALVES

PG-69.4 Power-actuated pressure relieving valves, having capacities certified in accordance with the provision of PG-69.3 and computed in accordance with the formula contained therein, shall be marked as required by PG-110 with the computed capacity, corresponding to 3% above the full load operating pressure and temperature

conditions at the valve inlet when the valve is operated

by the controller, and they shall also be stamped

with the set pressure of the controller. When the valve is marked as required by this paragraph, it shall be the guarantee

by the manufacturer that the valve also conforms to

the details of construction herein specified.

**PG-110 STAMPING OF BOILER PRESSURE RELIEF** 

### VALVES

(g) Certification Mark as shown in **Figure PG-105.1** with a "V" Designator placed under the Certification Mark. A marking method other than the stamp issued by the Society may be used, provided that it is acceptable to the ASME designated organization.



2013 ASME Boiler and Pressure Vessel Code Section I, Rules for Construction of Power Boilers. PG-69 CERTIFICATION OF CAPACITY OF

### PRESSURE RELIEF VALVES

PG-69.1 Before the Certification Mark is applied to any pressure relief valve or power-actuated pressure relieving valve, the valve manufacturer shall have the relieving capacity of his pressure relief valves certified in accordance with the provisions of this paragraph.

The ASME B&PVC Section I and VIII Division 1 marked valves meet the requirements B31.1 and B31.9 907.1.2. LANL will treat the ASME B&PVC Section I and VIII Division 1 marked valves as listed items for B31.9.