



**Conduct of Engineering  
Request for Variance or Alternate Method**

Assigned by SMPO or SMPOR:  Alternate Method  Variance

Tracking number **VAR-2011-078**

**1.0 Affected Document(s)**

<input type="checkbox"/> Engineering Processes (e.g., P 341) <input checked="" type="checkbox"/> Engineering Standards (e.g., P 342) <input type="checkbox"/> Engineering Training & Qualification (e.g., P 343) If against P documents themselves, revision: _____	Subordinate (Functional Series) document if applicable (ESM Chapter, Master Spec, AP, etc.): Document(s) Title/Number: ESM Chapter 17, "Pressure Safety", Rev. 3, Section 1, Program Requirements
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Section/Paragraph  
 ESM Chapter 17, Section 6.0, *General Program Statements*

Specific Requirement(s) as Written in the Document(s)

ESM Chapter 17, Section 6.0, *General Program Statements*

**6.0 General Program Statements**

**A. Basic Program Requirements**

1. Programmatic pressure systems, regardless of presence of vessels, where the source pressure is greater than 15 psig (including cryogenic, vapor pressure, chemical reaction and/or pump pressurized systems) must be designed to meet the requirements of the applicable ASME BPV and ASME B31 codes or CPSO-approved equivalent. These systems are subject to the certification requirements of this section.

2. Facility pressure systems (power boilers, heating boilers, shop supply air, etc) where the source pressure or pressure generated is greater than 15 psig are also subject to the certification requirements contained in this document (ASME Section IV boilers are not exempt).

**2.0 Request**

Brief descriptive title: Exclude pressure systems less than 15 psig from the requirements of ESM Chapter 17.

NCR required (work has occurred)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If Yes, NCR Number
TA-Bldg-(Room) and/or Project Affected: LANL	System/Component Affected: Leak Testing of LANL Legacy Systems

Proposal

Exclude pressure systems when safely protected to less than 15 psig from the requirement of ESM Chapter 17.

Justification/Compensatory Measures

The following excerpts from ASME B31.3 2008 provide justification to exclude pressure systems less than 15 psig:

300.1.3 Exclusions.  
 This Code excludes the following:  
 (a) piping systems designed for internal gage pressures at or above zero but less than 105 kPa (15 psi), provided the fluid handled is nonflammable, nontoxic, and not damaging to human tissues as defined in 300.2, and its design temperature is

from -29°C (-20°F) through 186°C (366°F)

### 301.2.2 Required Pressure Containment or Relief

(a) Provision shall be made to safely contain or relieve (see para. 322.6.3) any expected pressure to which the piping may be subjected. Piping not protected by a pressure relieving device, or that can be isolated from a pressure relieving device, shall be designed for at least the highest pressure that can be developed.

(b) Sources of pressure to be considered include ambient influences, pressure oscillations and surges, improper operation, decomposition of unstable fluids, static head, and failure of control devices.

(c) The allowances of para. 302.2.4(f) are permitted, provided that the other requirements of para. 302.2.4 are also met.

### 301.3 Design Temperature

The design temperature of each component in a piping system is the temperature at which, under the coincident pressure, the greatest thickness or highest component rating is required in accordance with para. 301.2. (To satisfy the requirements of para. 301.2, different components in the same piping system may have different design temperatures.) In establishing design temperatures, consider at least the fluid temperatures, ambient temperatures, solar radiation, heating or cooling medium temperatures, and the applicable provisions of paras. 301.3.2, 301.3.3, and 301.3.4.

301.3.1 Design Minimum Temperature. The design minimum temperature is the lowest component temperature expected in service. This temperature may establish special design requirements and material qualification requirements. See also paras. 301.4.4 and 323.2.2.

### Summary

B31.3 excludes pressure systems if less than 15 psig, nonflammable, nontoxic, and not damaging to human tissues with a design temperature from -29°C (-20°F) through 186°C (366°F) B31 series does not apply.

LANL pressure systems where the supply pressure is greater than 15 psig but have a relief device(s) proven adequate to protect the system from over pressurization by calculation or flow testing to less than 15 psig, and is nonflammable, nontoxic, and not damaging to human tissues with a design temperature from -29°C (-20°F) through 186°C (366°F) are excluded.

In order to maintain the LANL pressure system inventory a system identification tag shall be applied in accordance with ESM Chapter 17, Section 8.0, *System Identification Tag*, with the word Exempt on the tag.

The regulator and relief device must be close coupled with no intervening stop valves and identified in accordance with ESM Chapter 17 requirements.

A copy of a simplified system sketch and the documentation showing the system is adequately protected against overpressure shall be maintained as records, and must be managed per LANL P 1020, P 1020-1, and P 1020-2.

Relief device retest frequency is a 5 year interval.

Duration of Request:		Start Date:		End Date:	<input checked="" type="checkbox"/> Lifetime
Requestor Ari Ben Swartz		Z Number 2352511	Organization ES-DE	Signature SIGNATURE ON FILE	Date 05/31/2011
USQD/USID required (Nucl. High/Mod Hazard)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			If Yes, USQD/USID Number		
Design Authority Representative Stephen C. Diamond for Daniel L. Steinberg, ES-DO		Z Number 219039	Organization ES-DO	Signature SIGNATURE ON FILE	Date 06/01/2011
LANL Owning Manager (FOD or Programmatic) N/A		Z Number	Organization	Signature	Date

**3.0 Safety Management Program Owner (SMPO) Representative (SMPOR/POC)**

<input type="checkbox"/> Decline <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Accept Labwide <input type="checkbox"/> with Modification:			
POC Ari Ben Swartz, ES-DE	Z Number 2352511	Signature SIGNATURE ON FILE	Date 05/31/2011

**4.0 Additional Approval for P341 and APs; P342, ESM, Code, and Regulation Matters; and P343**

<input checked="" type="checkbox"/> Accepted <input type="checkbox"/> Accepted with comments <input type="checkbox"/> Declined			
Comments:			
Safety or Security Management Program Owner Stephen C. Diamond for Daniel L. Steinberg, ES-DO	Z Number 219039	Signature SIGNATURE ON FILE	Date 06/01/2011