

**RECORD OF REVISIONS**

Rev	Date	Description	POC	RM
0	9/17/2014	Initial issue. Formerly Subsection 7.0 of Section I rev. 3.	Ari Ben Swartz, <i>ES-EPD</i>	Larry Goen, <i>ES-DO</i>

**Contact the Standards POC for upkeep, interpretation, and variance issues.**

<b>Chapter 17</b>	<a href="#"><u>Pressure Safety POC and Committee</u></a>
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**Systems Excluded from Pressure Safety Program**

**Note:** Excluded-from-walkdown column refers to inventory effort circa 1999-2001, not entire program.

Type of system	Excluded from walk-downs but included in program	Excluded from pressure safety program
Domestic potable water systems designed per Universal Plumbing Code (UPC)		✓
Chilled water systems (except radiation contaminated)	✓	
Systems under NFPA Fire suppression systems covered by NFPA Codes and Standards [e.g., NFPA 13 (sprinklers) and NFPA 14 (standpipes)]. Natural gas systems from the service meter to the appliance meeting NFPA requirements.		✓
Fire extinguishers covered by 29 CFR 1910 and NFPA 10		✓
Control, instrument, and shop air or inert gas piping systems with MAWP not to exceed 150 psig and line sizes not to exceed NPS 3/8"	✓	
Gloveboxes ( <i>design pressure less than 15 psig</i> )		✓
Fuel storage pressure systems supplied with licensed motorized vehicles and meeting applicable DOT regulatory requirements		✓
Temporary non-LANL owned construction or maintenance related systems		✓
Vent or drain systems that are open to the atmosphere at all times, including storage tanks (open to the atmosphere at all times) that only are subjected to hydrostatic pressure and that comply with the		✓

**Section GEN – General Requirements**

Rev. 0, 9/17/2014

**Attachment GEN-2, Exclusions from Program**

Type of system	Excluded from walk-downs but included in program	Excluded from pressure safety program
applicable American Petroleum Institute (API) or Underwriters Laboratories Incorporated (UL) standards.		
Self-contained pressure eye wash systems, provided over pressure protection devices are periodically tested or replaced in accordance with manufacturer’s recommendation		✓
DOT specification containers periodically retested and re-qualified strictly in accordance with 49CFR180, provided that the owner’s OSHA inspection requirements of 29 CFR 1910.101 are met. (e.g. DOT gas cylinders)		✓
Natural gas distribution systems covered by DOT or 49CFR192 or other monitoring/maintenance regulation	✓	
Facility water and sewer systems such as drinking fountains, faucets, garden hoses lawn sprinkler systems, and the like that are not governed by ASME BPV or B31 codes <sup>1</sup>		✓
Packaged refrigeration (to include HVAC and refrigerators) units bought commercially, off-the-shelf, without modification not subject to B31.5		✓
Facility water wells, water tanks, and water distribution piping not subject to B31 codes. <sup>2</sup>		✓
Welding, brazing, or soldering equipment covered by other standards, for example CGA or 29CFR1910.		✓
Commercially available alternative fuel vehicles, such as propane-powered vehicles (49 CFR)		✓
Test Articles, flight weight, flight vehicle pressure systems (e.g. space vehicle propulsion systems and weapon gas systems)  Test Articles (as defined in Section I Attachment I-1 Definitions) and Test Article Systems must be shielded to prevent possibility of personnel injury; however, pressure systems that support the design, testing and/or evaluation of such hardware are not excluded. <sup>3</sup>		✓
Pressure relief protection on commercially-available, off-the-shelf (COTS) systems	✓	
Pressure vessels in COTS systems	✓	

<sup>1</sup> These are governed by the LANL-adopted plumbing code (see ESM Ch 16) or other non-ASME document.

<sup>2</sup> Ibid

<sup>3</sup> All research and development systems that must undergo continuous design changes must be reviewed by the CPSO

**1. Excluded Pressure Vessels, Relief Devices, and Systems**

- A. Excluded Pressure Systems (in addition to table above; in case of conflict, most stringent applies and contact CPSO).

CAUTION: Pressure systems, regardless of whether excluded or in this program, must be designed with appropriately sized pressure relief/vent systems and included in the LANL maintenance process. *For example, water holding tanks filled by pumps are considered excluded from this program; however, if the original pump on the water tank is replaced, a design review should be performed to ensure the pumping capacity of the new pump will not “out-flow” the capacity of the existing vent system.*

- 1. Pressure systems and/or components of pressure systems that cannot under any circumstance be designed in accordance with the ASME Boiler and Pressure Vessel Code or the B31 piping codes or Chapter 17 Section NASME or equivalent.
  - a. These items shall be shielded behind blast containment designed to withstand the explosive forces and release of shrapnel in the event of over pressurization. Only after sufficiently designed shielding has been installed to protect the work force may the pressure system or components be considered excluded from the pressure safety program and the requirements of this document. They are not considered excluded without the protective shielding.

NOTE: Prior to determining that a pressure system cannot be designed in accordance with the codes, the owner and designer shall consider equivalency provisions in 10CFR851, Appendix A, Part 4, Section (c) (*Att. REF-1 of this chapter*) which provides an alternate methodology to be invoked in cases when codes are not applicable.

- b. Items that do not pose a risk to personnel and where the risk of damage or system loss is acceptable to the CPSO do not have to comply with the requirements of ESM Chapter 17. To apply this exclusion, two items must be satisfied:
      - 1) The adequacy of the shielding to protect personnel from the potential failure of the pressurized components must be verified.
      - 2) Adequate documented controls must be in place to prevent inadvertent pressurization when personnel are not protected by the shielding, for example
        - i. Disconnection of all pressure sources
        - ii. Double block-and-bleed of all pressurization sources
- 2. Temporary non-LANL-owned construction- or maintenance-related systems provided the hazards to personnel are low and the operating subcontractor is contractually obligated to meet, and demonstrates compliance with, all applicable Federal, State and local safety regulations.
- 3. Commercially-available, off-the-shelf (COTS) equipment such as tools, gas chromatographs and mass spectrometers. However, when connected to a pressure source, the pressure source hardware is not excluded and must be designed per ASME B31.3.

**Attachment GEN-2, Exclusions from Program**

- a. Program does include modified or custom fabricated/assembled systems.
  - b. Program does require a temperature and pressure rating of the COTS, and the COTS item will be treated as pressure system component.
  - c. Relief devices and vessels included as COTS will be included into the LANL maintenance processes. LANL may elect not to perform maintenance on the items until the manufacturer's warranty has expired.
  - d. Design calculations are not required for package systems (e.g. boilers, air-compressors, or hydraulic power units) built by a reputable manufacturer that are not of unique design, with a retrievable model number. Such package units must be readily found in a catalog, or manufacturer's inventory, with proven design reliability. However, manufacturers data reports (e.g. U-1, U-1A), and system drawings (to include schematics) must be maintained in the pressure system documentation package.
  - e. Modification or an alteration to the above package systems voids this exemption. Drawings must be updated, and calculations must be performed to prove compliance with the applicable code.
4. Pre-packaged, unmodified, and off-the-shelf hydraulic power units (piping systems connected to such hydraulic units are not exempt if not designed and installed by the hydraulic unit manufacturer).
  5. Gloveboxes alone are excluded; however, purge and other pressure systems that interface with gloveboxes must have pressure relief that meets the requirements of ASME Section VIII, Division 1 Part UG-125 to keep the glovebox from being overpressurized.<sup>4</sup>
  6. Vacuum systems not pressurized internally or externally by a pressure source that is greater than 15 psig (source pressure can either be internal chemical reaction, or external pressure source) which is either temporarily or permanently connected.<sup>5</sup>

**B. Excluded Pressure Vessels**

1. Tanks and low pressure vessels that cannot accumulate above 15 psig.
2. Non-code building service or heating water surge tanks under 50 gallons.
3. Although not specifically included by the requirements of 10 CFR 851, vessels regulated by the Department of Transportation (DOT)<sup>6</sup> must follow the recertification frequency intervals as defined in this document.
  - a. Relief valves attached to such DOT vessels must follow the test/replacement schedule as defined in this document.

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<sup>4</sup> Gloveboxes should be protected from over pressurization with bubblers or other pressure relief device which exits through a vent system. Glove failure (popping off), window seal failure, or other such failures are not acceptable pressure relief methods. Glovebox design is covered by ESM Ch 6, LANL Master Spec 11 5311.08, AGS-G001, etc.

<sup>5</sup> Guidance on vacuum system design can be found in American Vacuum Society publications.

<sup>6</sup> Relief valves on DOT vessels are not excluded from this program, and must be maintained as defined in this document. Vessels must be within their inspection date as defined in the DOT, UN/IM section of this chapter.

**Attachment GEN-2, Exclusions from Program**

- b. DOT vessels are not required to be entered into MEL or CMMS (if the DOT vessel is permanently installed in the system; refer to Ch. 17 Section NASME)
- c. DOT vessels must be maintained within inspection interval dates.<sup>7</sup>
- 4. Pressure vessels in vehicle pneumatic and hydraulic systems.
- 5. Drained, depressurized, and vented out-of-service pressure systems that are so labeled.
- 6. Self-Contained Breathing Apparatus (SCBA) air cylinders.
- 7. Portable eyewash stations built to ANSI Z358.1 or ISEA Z358.1
- 8. Excluded vessels that are utilized in vapor condensation processes must have appropriate vacuum breathing mechanisms to prevent vessel collapse from the resulting vacuum, or be designed to withstand the associated forces.
- 9. Fire extinguishers covered by 29 CFR 1910 and NFPA 10.

**NOTE:** The following vessels cannot be excluded without acceptance by the CPSO or delegate through the variance process:

- Any vessel that is either permanently or temporarily connected to a pressure source (e.g. gas cylinder or dry ice) that is greater than 15 psig, or that can pressurize the volume to greater than 15 psig.
- Pressure containers that rely solely on interlocks to limit the pressure to less than 15 psig<sup>8</sup>
- Vacuum vessels that can be internally pressurized to greater than 15 psig.

**C. Excluded Pressure Relief Devices**

- 1. Rupture disk and fusible plugs on DOT gas cylinders.
- 2. Pressure relief devices on vehicle pneumatic and hydraulic systems.
- 3. Pressure relief devices on drained, depressurized, and out-of-service vessels.
- 4. Non-metallic, non-Code pressure relief valves on portable eyewash stations
- 5. Fusible plugs on refrigeration equipment that conforms to ASHRAE 15.
- 6. Pressure relief devices that do not provide a pressure protection function.
- 7. Pressure relief devices on transformers.
- 8. Hydrostatic bubblers, e.g., on gloveboxes.

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<sup>7</sup> A cylinder may be requalified at any time during or before the month and year that the requalification is due. However, a cylinder filled before the requalification becomes due may remain in service until it is emptied (49CFR180.205).

<sup>8</sup> See Code Case 2211 and ASME Section VIII, Division 1, Part UG-140.