

RECORD OF REVISIONS

Rev	Date	Description	POC	RM
0	9/17/2014	Initial issue.	Ari Ben Swartz, <i>ES-EPD</i>	Larry Goen, <i>ES-DO</i>

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

Chapter 17	<u>Pressure Safety POC and Committee</u>
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OSHA Pressure Safety Requirements

Pressure system shall meet the requirements of [29 CFR 1910](#).

1. A table that summarizes the applicable code requirements of the CFR is below; see CFR for the complete text and all the requirements.
2. Following the document(s) in the “LANL Applied Code” column satisfies the OSHA requirement for the systems listed.

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29CFR1910 Section	Citation	Code Reference	LANL Applied Code	Summary
1910 Subpart H - Hazardous Materials				
1910.101 - Compressed gases (general requirements).	1910.101(a)	CGA C-6 (1968) Standards for Visual Inspection of Compressed Gas Cylinders	CGA C-6	Visual Inspection
	1910.101(a).	CGA C-8 (1962) Standard for Requalification of ICC-3HT Cylinders	CGA C-8	Requalification
	1910.101(b)	CGA P-1	CGA P-1	Cylinder Use
	1910.101(c)	CGA S-1.1 (1963) and 1965 Addenda. Safety Release Device Standards-- Cylinders for Compressed Gases	CGA S-1.1	CGA S-1.2 (1963) Safety Release Device Standards, Cargo and Portable Tanks for Compressed Gases
	1910.101(c)	CGA S-1.2 (1963) Safety Release Device Standards, Cargo and Portable Tanks for Compressed Gases	CGA S-1.2	CGA S-1.2 (1963) Safety Release Device Standards, Cargo and Portable Tanks for Compressed Gases
1910.102 - Acetylene.	1910.102(a).	CGA G-1-2003 Acetylene	CGA G-1	Use
1910.103 - Hydrogen.	1910.103(c)(1)(i)(a)	API 620, Fourth Ed. [1970] Including Appendix R, Recommended Rules for Design and Construction of Large Welded Low Pressure Storage Tanks	API 620	Hydrogen containers shall comply with the following: Storage containers shall be designed, constructed, and tested in accordance with appropriate requirements of the ASME Boiler and Pressure Vessel Code, Section VIII - Unfired Pressure Vessels (1968) or applicable provisions of API Standard 620, Recommended Rules for Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Second Edition (June 1963) and appendix R (April 1965), which is incorporated by reference as specified in Sec. 1910.6.
	1910.103(c)(1)(i)(a)	ASME Boiler and Pressure Vessel Code, Section VIII - Unfired Pressure Vessels (1968) or applicable provisions of API Standard 620, Recommended Rules for Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Second Edition (June 1963) and appendix R (April 1965),	ASME Boiler and Pressure Vessel Code Section VIII	Hydrogen containers shall comply with the following: Storage containers shall be designed, constructed, and tested in accordance with appropriate requirements of the ASME Boiler and Pressure Vessel Code, Section VIII - Unfired Pressure Vessels (1968) or applicable provisions of API Standard 620, Recommended Rules for Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Second

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				Edition (June 1963) and appendix R (April 1965), which is incorporated by reference as specified in Sec. 1910.6.
	1910.103(c)(1)(i)(b)		49 CFR	Portable containers shall be designed, constructed and tested in accordance with DOT Specifications and Regulations.
	1910.103(c)(1)(iv)(a)(1)	CGA Pamphlet S-1, Part 3, Safety Relief Device Standards for Compressed Gas Storage Containers	CGA S-1, Part 3	Stationary liquefied hydrogen containers shall be equipped with safety relief devices sized in accordance with CGA Pamphlet S-1, Part 3, Safety Relief Device Standards for Compressed Gas Storage Containers, which is incorporated by reference as specified in Sec. 1910.6
	1910.103(c)(1)(iv)(a)(2)	CGA Pamphlet S-1, Safety Relief Device Standards, Part 1, Compressed Gas Cylinders and Part 2, Cargo and Portable Tank Containers.	CGA Pamphlet S-1, Safety Relief Device Standards, Part 1, Compressed Gas Cylinders and Part 2, Cargo and Portable Tank Containers.	Portable liquefied hydrogen containers complying with the U.S. Department of Transportation Regulations shall be equipped with safety relief devices as required in the U.S. Department of Transportation Specifications and Regulations. Safety relief devices shall be sized in accordance with the requirements of CGA Pamphlet S-1, Safety Relief Device Standards, Part 1, Compressed Gas Cylinders and Part 2, Cargo and Portable Tank Containers.
	1910.103(c)(1)(iv)(d)		ASME B31.12	Safety relief devices shall be provided in piping wherever liquefied hydrogen could be trapped between closures.
	1910.103(c)(1)(v)(b)	Pressure Piping Section 2 - Industrial Gas and Air Piping, ANSI B31.1-1967 with addenda B31.1-1969; Petroleum Refinery Piping ANSI B31.3-1966; Refrigeration Piping ANSI B31.5-1966	ASME B31.12	Gaseous hydrogen piping and tubing (above -20 deg. F.) shall conform to the applicable sections of Pressure Piping Section 2 - Industrial Gas and Air Piping, ANSI B31.1-1967 with addenda B31.1-1969. Design of liquefied hydrogen or cold (-20 deg. F. or below) gas piping shall use Petroleum Refinery Piping ANSI B31.3-1966 or Refrigeration Piping ANSI B31.5-1966 with addenda B31.5a-1968 as a guide, which is incorporated by reference as specified in Sec. 1910.6.
	1910.103(c)(1)(viii)(b)		ASME B31.12	The vaporizer and its piping shall be adequately protected on the hydrogen and heating media sections with safety relief

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				devices.
	1910.103(c)(2)(i)(f)		ASME B31.12	If liquefied hydrogen is located in (as specified in Table H-3) a separate building, in a special room, or inside buildings when not in a special room and exposed to other occupancies, containers shall have the safety relief devices vented unobstructed to the outdoors at a minimum elevation of 25 feet above grade to a safe location as required in paragraph (c)(1)(iv)(b) of this section.
	1910.103(c)(1)(iv)(a)(2)	CGA S-1.1 (1963) and 1965 Addenda. Safety Release Device Standards--Cylinders for Compressed Gases	CGA S-1.1	CGA S-1.2 (1963) Safety Release Device Standards, Cargo and Portable Tanks for Compressed Gases
	1910.103(c)(1)(iv)(a)(2)	CGA S-1.2 (1963) Safety Release Device Standards, Cargo and Portable Tanks for Compressed Gases	CGA S-1.2	CGA S-1.2 (1963) Safety Release Device Standards, Cargo and Portable Tanks for Compressed Gases
	1910.103(c)(1)(iv)(a)(2)	CGA S-1.3 (1959) Safety Release Device Standards-Compressed Gas Storage Containers	CGA S-1.3	Gas cylinders, portable tanks, & bulk Oxygen, Anhydrous Ammonia relief
	1910.103(b)(1)(iii)(b)	ANSI B31.1-67 and Addenda B31.1 (1969) Code for Pressure Piping,	B31.12	Code of record
	1910.103(b)(3)(v)(b)	ANSI B31.3-66 Petroleum Refinery Piping,	B31.12	Code of record
	1910.103(b)(3)(v)(b)	ANSI B31.5-66 Addenda B31.5a (1968) Refrigeration Piping	B31.12	Code of record
	1910.103	ASME Boiler and Pressure Vessel Code, § VIII, 1968,	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
1910.104 - Oxygen.	1910.104(b)(6)(iii)	CGA S-1.3 (1959) Safety Release Device Standards-Compressed Gas Storage Containers	CGA S-1.3	Gas cylinders, portable tanks, & bulk Oxygen, Anhydrous Ammonia relief
	1910.104(b)(5)(ii)	ANSI B31.1-67 and Addenda B31.1 (1969) Code for Pressure Piping,	B31.3	Code of record
	1910.104(b)(4)(ii)	ASME Boiler and Pressure Vessel Code, § VIII, 1968,	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
	1910.104(b)(4)(ii) and (b)(5)(iii)	ASME Boiler and Pressure Vessel Code, §VIII, Paragraph UG-84	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
1910.105 - Nitrous oxide.	1910.105	CGA G-8.1	CGA G-8.1	Design
1910.106 -	1910.106(i)(3)(i)	ASME Code for Pressure Vessels, 1968	ASME Boiler and	Code of record

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Flammable and combustible liquids.		Ed	Pressure Vessel Code Section VIII	
	1910.106(b)(1)(iv)(b)(2) and (i)(3)(ii)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
1910.107 - Spray finishing using flammable and combustible materials.	1910.107	ASME Boiler and Pressure Vessel Code, § VIII, 1968	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
1910.109 - Explosives and blasting agents.	1910.109(i)(1)(ii)(b)	CGA P-3	CGA P-3	Storage
1910.110 - Storage and handling of liquefied petroleum gases.	1910.110(b)(10)(iii) (Table H-26), (d)(2) (Table H-31); (e)(3)(i) (Table H-32), (h)(2) (Table H-34)	ASME Boiler and Pressure Vessel Code, § VIII,	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
	1910.110(b)(11)(i)(b) and (iii)(a)(1)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
	1910.110(g)(2)(iii)(b)(2)	ASME Code for Pressure Vessels, 1968 Ed	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
	1910.110(b)(3)(iii)	Code for Unfired Pressure Vessels for Petroleum Liquids and Gases of the API and the ASME, 1951	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
1910.111 - Storage and handling of anhydrous ammonia.	1910.111(d)(1)(ii)	API 620, Fourth Ed. [1970] Including Appendix R, Recommended Rules for Design and Construction of Large Welded Low Pressure Storage Tanks	API 620	Containers with a design pressure exceeding 15 psig shall be constructed in accordance with paragraph (b)(2) of this section, and the materials shall be selected from those listed in API Standard 620, Recommended Rules for Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Fourth Edition, 1970, Tables 2.02, R2.2, R2.2(A), R2.2.1, or R2.3, which are incorporated by reference as specified in § 1910.6.
	1910.111(d)(4)(ii)(b)	CGA S-1.3 (1959) Safety Release Device Standards-Compressed Gas Storage Containers	CGA S-1.3	Gas cylinders, portable tanks, & bulk Oxygen, Anhydrous Ammonia relief

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	1910.111(b)(7)(iii)	ANSI B31.5-66 Addenda B31.5a (1968) Refrigeration Piping,	ANSI B31.5	Code of record
	1910.111(b)(2)(vi)	ASME Boiler and Pressure Vessel Code, § VIII	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
	1910.111(b)(2)(i), (ii), and (iv)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
1910 Subpart I - Personal Protective Equipment				
1910.134 - Respiratory Protection.	1910.134(d)(1)	CGA G-7.1		Breathing air specification
1910 Subpart M - Compressed Gas and Compressed Air Equipment				
1910.169 - Air receivers.	1910.169(a)(2)(ii)		ASME Boiler and Pressure Vessel Code Section VIII	All safety valves used shall be constructed, installed, and maintained in accordance with the ASME Boiler and Pressure Vessel Code
	1910.169(b)(3)(iv)			All safety valves shall be tested frequently and at regular intervals to determine whether they are in good operating condition.
	1910.169(a)(2)(i) and (ii)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
1910 Subpart O - Machinery and Machine Guarding				
1910.217 - Mechanical power presses.	1910.217(b)(12)	ASME Code for Pressure Vessels, 1968 Ed	ASME Boiler and Pressure Vessel Code Section VIII	Code of record
1910.218 - Forging machines.	1910.218(d)(4) and (e)(1)(iv)	ANSI B31.1-67 and Addenda B31.1 (1969) Code for Pressure Piping,	B31.3	Code of record
1910 Subpart Q - Welding, Cutting, and Brazing				
1910.252 - General requirements.	1910.252(d)(1)(vi)	API 2201 (1963) Welding or Hot Tapping on Equipment Containing Flammables,	API 2201	Flammable substance lines. The connection, by welding, of branches to pipelines carrying flammable substances shall be performed in

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				accordance with Welding or Hot Tapping on Equipment Containing Flammables, API Std. PSD No. 2201-1963, which is incorporated by reference as specified in Sec. 1910.6.
	1910.252(d)(1)(v)	API 1104 (1968) Standard for Welding Pipelines and Related Facilities	API 1104	Construction standards. The welded construction of transmission pipelines shall be conducted in accordance with the Standard for Welding Pipe Lines and Related Facilities, API Std. 1104-1968, which is incorporated by reference as specified in Sec. 1910.6
1910.253 - Oxygen-fuel gas welding and cutting.	1910.253(e)(4)(v) and (5)(iii)	CGA 1957 Standard Hose Connection Standard	CGA 1957	Ox/Ace station termination in union & hose connections
	1910.253(e)(5)(i)	CGA and RMA (Rubber Manufacturer's Association) Specification for Rubber Welding Hose (1958)	CGA and RMA (Rubber Manufacturer's Association) Specification for Rubber Welding Hose (1958)	Oxy-Fuel hoses
	§1910.253(e)(4)(iv) and (6)	CGA 1958 Regulator Connection Standard	CGA 1958 Regulator Connection Standard	Detachable regulator & regulatory requirements
	1910.253(d)(4)(ii)	ANSI A13.1-56 Scheme for the Identification of Piping Systems	ANSI A13.1	Above ground Pipe marking Oxygen-Fuel Gas
	1910.253(d)(1)(i)(A)	ANSI B31.1-67	B31.3	Code of record
1910.254 - Arc welding and cutting.	1910.254(b)(1)			General. Assurance of consideration of safety in design is obtainable by choosing apparatus complying with the Requirements for Electric Arc-Welding Apparatus, NEMA EW-1-1962, National Electrical Manufacturers Association or the Safety Standard for Transformer-Type Arc-Welding Machines, ANSI C33.2-1956, Underwriters' Laboratories, both of which are incorporated by reference as specified in Sec. 1910.6