Bridgeport Attachment A

Recognized and Generally Accepted Good Engineering Practices

Industry standards of care for distributors of propane and compressed gases include, among others:

State Fire Code

- Connecticut State Fire Prevention Code is based on National Fire Protection Association ("NFPA") codes, with Connecticut amendments. See Chapter 2 for list of incorporated NFPA codes and Chapter 69, Liquefied Petroleum Gases and Liquified Natural Gases. The 2022 Connecticut State Fire Prevention Code incorporates the following versions of NFPA codes relevant to this matter: NFPA 1 (2021); NFPA 58 (2020); NFPA 55 (2020); NFPA 400 (2019); NFPA 30 (2021).

NFPA Codes

- NFPA 58, *Liquid Petroleum Gas Code* ("NFPA 58")
- NFPA 55, *Compressed Gas and Cryogenic Fluids Code* ("NFPA 55")
- NFPA 30, *Flammable and Combustible Liquids Code* ("NFPA 30")
- NFPA 101, *Life Safety Code* ("NFPA 101")

American Society of Mechanical Engineers Standards ("ASME")

- ASME Scheme for Identification of Piping Systems 13.1

Some of the above standards are consistently relied upon by propane experts and are often incorporated into state building, mechanical, and fire codes.

The chart below cites to the standards of care that were in effect in early 2023, when the EPA inspection occurred, or to earlier versions that are incorporated by reference into the Connecticut Fire Code. The portions of these standards cited here have not substantively changed since 2015 when the large propane tank was installed at this facility.

Condition Number	Area of Concern	Examples of RAGAGEP
1	Propane transfer stations were not secured from tampering via an enclosure nor were the valve connections locked out to prevent unauthorized operation.	NFPA 58-2020, § 6.21.4.2 (plant areas that include container appurtenances, pumping equipment, loading and unloading facilities, and container filling facilities shall be enclosed with a minimum 6-foot-high fence, unless, among other exceptions, devices can be locked in place to prevent unauthorized operation of valves, equipment, and appurtenances – see § 61.21.4.2.E)
2	Access to the egress gate in the northeast corner of the fenced area was impeded by piping.	NFPA 101-2021, § 7.1.10.1 (No furnishings, decorations, or other objects shall obstruct exits or their access thereto, egress therefrom, or visibility thereof.) NFPA 58-2020, § 6.21.4.2.D (requiring fences limiting unauthorized access to sensitive areas to include "[c]learance of at least 3 ft (1 m)…to allow emergency access to the required means of egress")
3	Smaller propane containers and methanol (flammable liquid) were not properly separated from the intermediate propane tank within the fenced area, and the methanol tank in filling area was not sufficiently separate from the big propane tank.	NFPA 58-2020, §§ 6.4 (establishing required separation distances for LP-gas containers and setting 3 feet as necessary between LP-gas tanks containing at least 251 gal or more water capacity and other LP-gas containers); 6.5.3.9 (requiring compliance with NFPA 55 in the storage of LP-Gas containers and oxygen)
4	Containers of propane in metal cages and outside of them in the fenced area were not on level ground and were not properly secured to prevent them from falling or being knocked over.	NFPA 55-2020, § 7.1.8.4 ("Compressed gas cylinders, containers, and tanks in use or in storage shall be secured to prevent them from falling or being knocked over by corralling them and securing them to a car, framework, or fixed object by use of a restraint…") NFPA 58-2020, § 15.3.1.3 (surface under temporary containers shall be per section 6.8.5.2, which includes requirement the surface be level)
5	Piping in the propane designated area was not properly labeled.	ASME A13.1-2015, §§ 3.1–3.5
6	Egress gates in the fenced area are not equipped with panic hardware.	NFPA 101-2021, § 7.2.1.7 (requiring panic or fire exit hardware of specified types for various door assemblies)

Condition Number	Area of Concern	Examples of RAGAGEP
7	Some of the propane storage cages were not affixed with NFPA signage. `	NFPA 1-2021, § 60.5.1.8.2.1(3) (requiring NFPA 704 hazard identification signs at entrances to locations where hazardous materials are stored, dispensed, and used, and on stationary aboveground containers) NFPA 704-2017, § 4.3 ("Signs shall be in locations approved by the [AHJ] and as a minimum shall be posted at…(3) Each principal means of access to an exterior storage area.")
8	Two shutdown buttons near the truck loading operation were not labeled, and the two emergency shutoff buttons mounted on the saddle for the 30,000-gallon propane tank were not properly labeled to indicate the function of each.	NFPA 58-2020, §§ 6.13.5 ("Emergency remote shutdown stations shall be identified by a sign, visible from the point of transfer, incorporating the words "Propane – Container Liquid Valve Emergency Shutoff" in block letters of not less than 2 in (51mm) in height on a background of contrasting color to the letters."); 6.14.12.1 ("Each emergency shutoff valve shall have at least one clearly identified and easily accessible manually operated remote emergency shutoff device."); 6.29.4.3 ("Emergency controls shall be conspicuously marked, and the controls shall be located so as to be readily accessible in emergencies.) NFPA 1-2021, § 69.3.10.12.1 ("Each emergency shutoff valve shall have at least one clearly identified and easily accessible manually operated remote emergency shutoff device")

Condition Number	Area of Concern	Examples of RAGAGEP
9	No hose safety management program to ensure ongoing integrity of the propane transfer hoses.	NAHAD Handbook for the Design and Specification of Hose Assemblies (2015) §§ 12.5 (recommending a hose fitting and maintenance inspection program based on past history and manufacturer's recommendations for the frequency of visual inspections and functional tests or, in the absence of such information, before each shift or at least once a day), 2.4.5 (referencing the use of UL 21 and UL 569 hoses for LP Gas) NFPA 58-2020, § 15.6.2.1 (requiring that, at bulk plants, hose assemblies be inspected as specified in § 7.2.4 and replaced, repaired, or continued in service based on the results of the inspection. In turn, § 7.2.4 requires, among other things, annual inspections. Also, in accordance with § 6.27.4, hoses for vehicle fuel dispensers shall not exceed 18 feet, shall be listed, and secured when not in use.)
10	There were signs of accelerated rusting on the underside of the tank where it meets the saddle, on the piping where it rests on wood/rubber spacers bolts, and on piping where zip ties had previously been and under was not properly painted and exhibited signs of accelerated rusting.	NFPA 58-2020, §§ 6.11.3.12 ("The portion of aboveground piping in contact with a support or a corrosion-causing substance shall be protected against corrosion."); 6.19.1 ("All materials and equipment installed above ground shall be of corrosion-resistant material or shall be coated or protected to minimize exterior corrosion.") NFPA 30-2021, § 27.6.4 ("Aboveground piping systems that are subject to external corrosion shall be suitably protected.")