U.S. Department
of Transportation
**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

October 21, 2025

Mr. Harry C. Parker, PE
Mechanical Supervisor
Matrix PDM Engineering
100 Beecham Drive, Suite 200
Pittsburg, PA 15205

Dear Mr. Parker:

In a letter dated October 23, 2024, Matrix PDM Engineering (Matrix PDM) requested a written regulatory interpretation from the Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Pipeline Safety (OPS) regarding the applicability of the liquefied natural gas (LNG) facilities safety standards in Title 49, Code of Federal Regulations (CFR) Part 193 to "pressure vessels" and "heat exchangers." Specifically, Matrix PDM asked if pressure vessels or heat exchangers that do not contain any flammable, toxic, or corrosive gas or liquid are subject to the regulations under 49 CFR Part 193 and the National Fire Protection Association's Standard for the Production, Storage, and Handling of Liquefied Natural Gas, 2001 edition (NFPA-59A-2001), as incorporated by reference in 49 CFR § 193.2013.

Background

NFPA-59A-2001 sections 3.4.2 and 3.4.3 specify that boilers and pressure vessels (section 3.4.2) and shell and tube heat exchangers (section 3.4.3) must be designed and fabricated in accordance with certain standards, such as ASME Boiler and Pressure Vessel Code (BPVC) Section VIII, Division 1. Matrix PDM presented three questions regarding the applicability of NFPA-59A-2001 to specific boilers (pressure vessels) and shell and tube heat exchangers (heat exchangers) within a jurisdictional LNG plant (as defined in 49 CFR § 193.2007).

- First, Matrix PDM asked if all pressure vessels and heat exchanges utilized in a jurisdictional LNG plant are subject to NFPA-59A-2001, or only those that contain or utilize a hazardous fluid.
- Second, Matrix PDM asked if the guidance in PHMSA's LNG Frequently Asked Questions (FAQ), questions D5 and D6, apply to "all" pressure vessels and heat exchangers, regardless of service.
- Third, Matrix PDM asked if PHMSA fully adopts ASME BPVC Section VIII, Division 1, including paragraph U-1.

Relevant Regulations

OPS has determined the following regulations are relevant to Matrix PDM's request for interpretation:

- **49 CFR § 193.2007 Definitions.**
  - *Component* means any part, or system of parts functioning as a unit, including, but not limited to, piping, processing equipment, containers, control devices, impounding systems, lighting, security devices, fire control equipment, and communication equipment, whose integrity or reliability is necessary to maintain safety in controlling, processing, or containing a hazardous fluid.
  - *Gas*, except when designated as inert, means natural gas, other flammable gas, or gas which is toxic or corrosive.
  - *Hazardous fluid* means gas or hazardous liquid.
  - *Hazardous liquid* means LNG or a liquid that is flammable or toxic.
  - *LNG facility* means a pipeline facility that is used for liquefying natural gas or synthetic gas or transferring, storing, or vaporizing liquefied natural gas.
  - *LNG plant* means an LNG facility or system of LNG facilities functioning as a unit.
- **49 CFR § 193.2401 Scope.** After March 31, 2000, each new, replaced, relocated or significantly altered vaporization equipment, liquefaction equipment, and control systems must be designed, fabricated, and installed in accordance with requirements of this part and of NFPA-59A-2001. In the event of a conflict between this part and NFPA 59A (incorporated by reference, see § 193.2013), this part prevails.
- **NFPA-59A-2001 Section 3.4.2.** Boilers shall be designed and fabricated in accordance with the ASME *Boiler and Pressure Vessel Code*, Section I, or CSA Standard B 51, *Boiler, Pressure Vessel and Pressure Piping Code*, and pressure vessels shall be designed and fabricated in accordance with the ASME *Boiler and Pressure Vessel Code*, Section VIII, Division 1 or Division 2, or CSA Standard B 51, *Boiler, Pressure Vessel and Pressure Piping Code*, and shall be code-stamped.
- **NFPA-59A-2001 Section 3.4.3.** Shell and tube heat exchangers shall be designed and fabricated in accordance with the standards of the Tubular Exchanger Manufacturers Association (TEMA). The shells and internals of all exchangers shall be pressure tested, inspected, and stamped in accordance with the ASME *Boiler Pressure Vessel Code*, Section VIII, Division 1 or Division 2, or CSA B51, where such components fall within the jurisdiction of the pressure vessel code.
- **ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, 1992 Edition, Section U-1(c).** The following classes of vessels are not considered to be within the scope of this Division:
  - (1) those within the scope of other Sections;
  - (2) fired process tubular heaters;
  - (3) pressure containers which are integral parts or components of rotating or reciprocating mechanical devices, such as pumps, compressors, turbines,

generators, engines, and hydraulic or pneumatic cylinders where the primary design considerations and/or stresses are derived from the functional requirements of the device;

- (4) except as covered in U-l(t), structures whose primary function is the transport of fluids from one location to another within a system of which it is an integral part, that is, piping systems;
- (5) piping components, such as pipe, flanges, bolting, gaskets, valves, expansion joints, fittings, and the pressure containing parts of other components, such as strainers and devices which serve such purposes as mixing, separating, snubbing, distributing, and metering or controlling flow, provided that pressure containing parts of such components are generally recognized as piping components or accessories;
- (6) a vessel for containing water under pressure, including those containing air, the compression of which serves only as a cushion, when none of the following limitations are exceeded: (a) a design pressure of 300 psi; (b) a design temperature of 21 0°F.
- (7) a hot water supply storage tank heated by steam or any other indirect means when none of the following limitations is exceeded: (a) a heat input of 200,000 Btu/hr; (b) a water temperature of 2l0°F; (c) a nominal water containing capacity of 120 gal;
- (8) vessels having an internal or external operating pressure (see 3-2) not exceeding 15 psi with no limitation on size [see UG-28(e)];
- (9) vessels having an inside diameter, width, height, or cross section diagonal not exceeding 6 in., with. no limitation on length of vessel or pressure;
- (10) pressure vessels for human occupancy.

- **LNG Plant Requirements: Frequently Asked Questions.**[1]

Analysis

Each new, replaced, relocated, or significantly altered vaporization equipment, liquefaction equipment, and control system must be designed, fabricated, and installed in accordance with the requirements of Part 193 and of NFPA-59A-2001. 49 CFR § 193.2401. Boilers, pressure vessels, and shell and tube heat exchangers are types of equipment that may be used in vaporization and liquefaction. In addition, PHMSA has defined a "component" in 49 CFR § 193.2007 as any part, or system of parts functioning as a unit, including processing equipment and other equipment, whose integrity or reliability is necessary to maintain safety in controlling, processing, or containing a hazardous fluid (e.g., gas or LNG). PHMSA has previously said that "[t]he term 'component' has a very broad meaning in Part 193." PHMSA Interpretation Response #PI-10-0020, p. 12, fn. 54 (Mar. 25, 2010).

[1] PHMSA, LNG Plant Requirements: Frequently Asked Questions, https://www.phmsa.dot.gov/pipeline/liquified-natural-gas/lng-plant-requirements-frequently-asked-questions (last updated Aug. 19, 2025).

If any process or processing equipment, such as a boiler, pressure vessel, or heat exchanger, is necessary to maintain safety when liquefying, storing, vaporizing, or transferring LNG, or controlling, processing, or containing a hazardous fluid, then it is a "component" and must be designed in accordance with 49 CFR Part 193 and NFPA-59A-2001, if replaced, relocated, or significantly altered after March 31, 2000, see 49 CFR § 193.2401.

Question 1: In the context of NFPA-59A-2001, does the terms "pressure vessels" in section 3.4.2 and "heat exchanger" in section 3.4.3 literally mean "all" pressure vessels and heat exchangers within an LNG plant, or just those that contain a hazardous fluid?

PHMSA Response: NFPA-59A-2001 sections 3.4.2 and 3.4.3 apply to all boilers, pressure vessels, and shell and tube heat exchangers that are necessary to maintain safety when liquefying, storing, vaporizing, or transferring LNG, or controlling, processing, or containing a hazardous fluid.

NFPA-59A-2001 sections 3.4.2 and 3.4.3 apply to certain pressure vessels or shell and tube heat exchangers that do not contain a hazardous fluid but are "necessary to maintain safety in controlling, processing, or containing a hazardous fluid" when liquefying, storing, vaporizing, or transferring LNG (e.g., instrument air dryer tower vessels), liquefying natural gas (e.g., nitrogen storage vessels), or vaporizing LNG (e.g., heating medium fluid expansion tanks).

NFPA-59A-2001 sections 3.4.2 and 3.4.3 does not apply to certain pressure vessels or shell and tube heat exchangers that are not "necessary to maintain safety in controlling, processing, or containing a hazardous fluid" when liquefying, storing, vaporizing, or transferring LNG, such as those used for utility services (e.g., a pressure vessel used in plant air system for running shop tools, storage of inert gases not connected to components, or similar utility use outside the controlling, processing, or containing of a hazardous fluid). NFPA-59A-2001 sections 3.4.2 and 3.4.3 also does not apply to air-cooled heat exchangers because they are not shell and tube heat exchangers.

Question 2: Does NFPA-59A-2001, section 1.2, as well as PHMSA LNG FAQs D5 and D6, apply to all pressure vessels and heat exchangers within the LNG plant, regardless of service?

PHMSA Response: All pressure vessels boilers, pressure vessels, and shell and tube heat exchangers that are necessary to maintain safety when liquefying, storing, vaporizing, or transferring LNG, or controlling, processing, or containing a hazardous fluid are subject to 49 CFR Part 193 and NFPA-59A-2001, and the associated LNG FAQs, including FAQs D5 and D6.

Question 3: Does PHMSA fully adopt ASME BPVC, Section VIII, Division 1, paragraph U-1?

PHMSA Response: PHMSA has incorporated by reference ASME BPVC, Section VIII, Division 1 in its entirety (see 49 CFR § 193.2013). In the event of a conflict between 49 CFR Part 193 and NFPA-59A-2001 (and any technical standard incorporated by reference in NFPA-59A-2001, such as the ASME BPVC, Section VIII, Division 1), Part 193 prevails. For example,

if any of the pressure vessels and shell and tube heat exchangers fall within the classes of vessels in paragraph U-1 of the ASME BPVC, Section VIII, Division 1 but are a "component" as defined in Part 193 that are "necessary to maintain safety in controlling, processing, or containing a hazardous fluid," then they must be designed in accordance with 49 CFR § 193.2401 and sections 3.4.2 and 3.4.3 in NFPA-59A-2001, and the associated LNG FAQs, including FAQs D5 and D6.

If we can be of further assistance, please contact Joseph Berry at (720) 601-3577.

Sincerely,

JOHN A GALE

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John A. Gale
Director, Office of
Standards and Rulemaking

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ENGINEERIN G

Harry C. Parker, PE
Mechanical Supervisor
Matrix PDM Engineering
100 Beecham Drive, Suite 200
Pittsburgh, PA 15205
(412) 894-2270
harryparker@Matrixpdm.com

October 23, 2024

Attn: Mr. Shane Kelley
Director, Standards and Rulemaktng Division
U.S. DOT/PHMSA (PHH-10)
1200 New Jersey Avenue
SE East Building, 2nd Floor
Washington, DC 20590

Dear Mr. Kelley,"

Matrix PDM requests a PHMSA ruling on the following questions we have pertaining to ASME PressureVessel-s and HeatExclilangers, specifically compliance t0 NFPA 59A (2001) and PHMSA FAQ D5 &,D6 when,constrwcting this equipment for an LNG Facility:

1) Regarding section 3.4.2 of NFPA 59A (2001) wherein the words "pressure vessels" are used, and section 3.4.3 of NFPA 59A (2001) wherein the words "all heat exchangers" are used, does PHMSA interpret these words to mean literally all pressure vessels and all heat exchangers within the boundary limits of any LNG Facility (under PHMSA _Jurisdicjion), regardless of pressure vessel or heat exchanger service (NG, Air, N2, etc.) - and regardless pf,the state.of the media contained (gas or liquid)?

   a. As an example, would this also include vessels and heat exchangers purposed as either compressed air receivers, compressed instrument air dryer tower vessels (such as for packaged heatless desiccant instrument air dryer skids), water propylene-glycol expansion tanks, water propylene-glycol air-cooled heat ex,ch ngers, gaseous nitrogen storage vessels, or other similar vessels meant for

purposes of utility, or for inert or non-toxic/ non-hazardous fluid service, and not containing hydrocarbons nor hazardous fluids in any form? (Hazardous Fluids as defined in 49 CFR Part 193)

b. Or do these requirements apply only to vessels and exchangers in hydrocarbon service or hazardous fluid service? (Hazardous Fluids as defined in 49 CFR Part 193)

2) Does PHMSA FAQ DS & D6 and the requirements outlined therein for demonstrating safety equivalency required by section 1.2 of NFPA 59A (2001) apply to literally all pressure vessels and heat exchangers within the boundary limits of an LNG Facility, regardless of pressure vessel or heat exchanger service?

a. Or are these requirements limited to vessels and heat exchangers in either hydrocarbon service or hazardous fluid service as per the description given in question (1b) above?

3) Does PHMSA fully adopt ASME BPVC Section VIII Division 1 paragraph U-1 Scope as it pertains to which pressure vessels and heat exchangers must be designed, constructed, tested, inspected and stampe_d according to the rules of this Division versus those that are not considered to be within the scope of this Division?

a. If for example we have a vessel that qualifies as exempt per paragraph U-1, does this mean that NFPA 59A (2001) section 1.2 and therefore PHMSA FAQ DS & D6 do not apply?

As standard practice we err on the side of a conservative interpretation of these rules but would nevertheless like to know if we're over-applying FAQ DS and D6 and the requirement for demonstrating safety equivalency. We appreciate your assistance and forthcoming ruling on these matters.

Best regards,

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Harry C. Parker, PE
Mechanical Supervisor

CC: Chad R. Green, PE, Mechanical Chief (Matrix PDM)

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