



U.S. Department
of Transportation

1200 New Jersey Avenue, SE
Washington, DC 20590

**Pipeline and Hazardous
Materials Safety Administration**

October 7, 2021

Mr. Juan Carlos Rivadeneira
Engineer
CH-IV
1221 McKinney, Suite 3333
Houston, TX 77010

Dear Mr. Rivadeneira:

In a letter to the Pipeline and Hazardous Materials Safety Administration (PHMSA), dated August 19, 2021, you requested an interpretation of the minimum pipeline welding inspection and testing requirements for piping systems and components for flammable liquids and flammable gases with service temperatures above -20 degrees Fahrenheit ($^{\circ}\text{F}$) (-29 $^{\circ}\text{C}$) to comply with 49 Code of Federal Regulations (CFR) \S 193.2303. Specifically, you sought confirmation that for these piping systems and components to comply with \S 193.2303, a minimum of 30 percent of each day's circumferentially welded pipe joints must be nondestructively tested over the entire circumference.

Section 193.2303 incorporates by reference the 2001 edition of National Fire Protection Association Standard 59A (NFPA 59A-2001), and Chapter 6 of NFPA 59A-2001 specifies requirements for piping systems and components. While paragraph 6.1.1 of NFPA 59A-2001 requires that all piping systems comply with the 1996 Edition of ASME B31.3, it further states that the additional provisions of Chapter 6 of NFPA 59A-2001 shall apply to piping systems and components for flammable liquids and flammable gases with service temperatures below -20 $^{\circ}\text{F}$ (-29 $^{\circ}\text{C}$). The provision found in paragraph 6.6.3.2 of NFPA 59A-2001, which requires that all circumferential butt welds be examined fully by radiographic or ultrasonic inspection, contains an exception for pressure piping operating above -20 $^{\circ}\text{F}$ (-29 $^{\circ}\text{C}$). Specifically, Exception No. 2 to paragraph 6.6.3.2 states:

Pressure piping operating above -20 $^{\circ}\text{F}$ (-29 $^{\circ}\text{C}$) shall have 30 percent of each day's circumferentially welded pipe joints nondestructively tested over the entire circumference in accordance with ASME B31.3.

Moreover, paragraph 341.4.1(b)(1) of ASME B31.3 requires that not less than 5 percent of circumferential butt and miter groove welds be examined fully by random radiography in accordance with paragraph 344.5 or by random ultrasonic examination in accordance with paragraph 344.6. However, performing a minimum of 5 percent of examination per ASME B31.3 does not meet the requirements in NFPA 59A-2001. Instead, an operator shall have 30

percent testing for each day's circumferentially welded pipe joints in accordance with NFPA 59A-2001.

Therefore, PHMSA agrees with your interpretation of the NFPA 59A-2001 requirements that for flammable liquids and flammable gases with service temperatures above -20°F (-29°C) to comply with § 193.2303, a minimum of 30 percent of each day's circumferentially welded pipe joints must be nondestructively tested over the entire circumference.

If we can be of further assistance, please contact Tewabe Asebe at 202-366-5523.

Sincerely,

John A. Gale
Director, Office of Standards
and Rulemaking



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August 19, 2021

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Title 49 of the Code of Federal Regulations Interpretation of Part 193, Section 193.2303

Dear Mr. Gale,

This letter is a formal request for written interpretation of the referenced section of Title 49 of the Code of Federal Regulations Part 193. This interpretation is requested to clarify the minimum inspection and testing requirements for piping systems and components for flammable liquids and flammable gases with service temperatures **above** -20°F (-29°C) to comply with §193.2303.

§193.2303 states:

“No person may place in service any component until it passes all applicable inspections and tests prescribed by this subpart and NFPA-59A-2001 (incorporated by reference, see §193.2013).”

NFPA-59A-2001 Chapter 6 provides requirements for inspection and testing for piping systems used in LNG facilities. In particular, NFPA-59A-2001 Section 6.1.1 states:

*“All piping systems shall be in accordance with ASME B31.3, Process Piping. The additional provisions of this chapter shall apply to piping systems and components for flammable liquids and flammable gases with service temperatures **below** -20°F (-29°C).*

Exception: Fuel gas systems covered by NFPA 54, National Fuel Gas Code.”

From NFPA-59A-2001 Section 6.1.1, it is understood that all piping systems in the LNG facility have to meet the requirements of ASME B31.3, regardless of their operating conditions and service. NFPA-59A-2001 Section 6.1.1 specifically notes that the additional provisions in Chapter 6 apply to piping systems and components for flammable liquids and flammable gases with service temperatures **below** -20°F (-29°C). Therefore, it is implied that Section 6.1.1 does not apply to piping systems and components for flammable liquids and flammable gases with service temperatures **above** -20°F (-29°C) and these shall meet the requirements of ASME B31.3 only.



NFPA-59A-2001 Section 6.6.3.2 provides requirements for nondestructive examination of applicable piping systems covered by *Chapter 6*. *NFPA-59A-2001 Section 6.6.3.2* states:

“All circumferential butt welds shall be examined fully by radiographic or ultrasonic inspection.

Exception No. 1: Liquid drain and vapor vent piping with an operating pressure that produces a hoop stress of less than 20 percent specified minimum yield stress shall not be required to be nondestructively tested if it has been inspected visually in accordance with ASME B 31.3, Process Piping, Section 344.2.

Exception No. 2: Pressure piping operating above -20°F (-29°C) shall have 30 percent of each day’s circumferentially welded pipe joints nondestructively tested over the entire circumference in accordance with ASME B 31.3.”

Note that *Exception No. 2* in *NFPA-59A-2001 Section 6.6.3.2* specifies that piping systems operating **above** -20°F (-29°C) shall have 30 percent of each day’s circumferentially welded pipe joints nondestructively tested over the entire circumference in accordance with ASME B31.3. Therefore, it is understood that *NFPA-59A-2001 Section 6.6.3.2 Exception No. 2* modifies the requirements of *Section 6.1.1*. This is supported by the fact that *ASME B31.3 Section 341.4.1(b)(1)* states:

“Not less than 5% of circumferential butt and miter groove welds shall be examined fully by random radiography in accordance with para. 344.5 or by random ultrasonic examination in accordance with para. 344.6...”

Thus, it is understood that for piping systems and components for flammable liquids and flammable gases with service temperatures **above** -20°F (-29°C) to comply with §193.2303, a minimum of 30 percent of each day’s circumferentially welded pipe joints shall be nondestructively tested over the entire circumference and that performing the minimum of 5 percent examination per *ASME B31.3 Section 341.4.1(b)(1)* does not meet the requirements of §193.2303.

We would like to confirm that for piping systems and components for flammable liquids and flammable gases with service temperatures **above** -20°F (-29°C) to comply with §193.2303, a minimum of 30 percent of each day’s circumferentially welded pipe joints shall be nondestructively tested over the entire circumference.

Looking forward to your feedback, I am available for future discussions as needed. Thank you for handling this matter and I look forward to hearing from you soon.

Sincerely,

JUAN CARLOS RIVADENEIRA
Engineer