



U.S. Department
of Transportation

1200 New Jersey Avenue, SE
Washington, DC 20590

**Pipeline and Hazardous
Materials Safety Administration**

April 23, 2020

Mr. Scott Ray
Senior VP Engineering and Permitting
Commonwealth LNG
1 Riverway, Suite 500
Houston, TX 77056

Dear Mr. Ray:

In a letter to the Pipeline and Hazardous Materials Safety Administration (PHMSA), dated January 6, 2020, you requested an interpretation of 49 Code of Federal Regulations (CFR) Part 193. Specifically, you requested an interpretation regarding §§ 193.2161 and 193.2167.

You stated that Commonwealth LNG, LLC, proposes to construct and operate a natural gas liquefaction and export facility in Cameron Parish, Louisiana. You stated the liquefied natural gas (LNG) facility would have six 40,000 cubic meter full containment LNG tanks with parameters of: nominally 165 feet high, nominally 131 feet diameter, primary (internal liquid container) tank wall of 9 percent Nickel (9 % Ni) steel, and secondary (outer liquid container) tank wall of 9 % Ni steel. You stated that the design Standards and Codes would be per American Petroleum Institute and National Fire Protection Association (NFPA) 59A.

You state that the 2019 edition of NFPA 59A Standard (NFPA 59A-2019) allows for a full containment tank system with the secondary (i.e. outer) liquid container and roof to be constructed either from metal or of pre-stressed concrete. Also, you stated that the secondary metal 9 % Ni container wall is suitable for exposure to cryogenic temperatures, and the preliminary design of the secondary LNG container considers missile impact criteria per the Nuclear Regulatory Commission Regulatory Guide 1.221.

You stated that currently 49 CFR Part 193 incorporates by reference the 2001 edition of NFPA 59A (NFPA 59A-2001), whereas your proposed design is based on the NFPA 59A-2019. You further stated that §§ 193.2161 and 193.2167 prescribe a requirement that the secondary container be of concrete - in apparent conflict with NFPA 59A-2019. You believe that the proposed LNG storage tank design fulfills the safety objectives of NFPA 59A-2019. Therefore, you request PHMSA's interpretation of whether your secondary container design material would comply with the intent of §§ 193.2161 and 193.2167.

Section 193.2161, Dikes general, requires that, "An outer wall of a component served by an impounding system may not be used as a dike unless the outer wall is constructed of concrete."

Likewise, § 193.2167, Covered Systems, requires that “A covered impounding system is prohibited except for concrete wall designed tanks where the concrete wall is an outer wall serving as a dike.” Therefore, the outer wall of an LNG storage tank must be concrete. Otherwise, the outer wall may not be used as a dike.

Because your secondary containment is made of 9 % Ni steel, it does not comply with the current requirements of §§ 193.2161 and 193.2167. Please note that while your design may comply with NFPA 59A-2019, Part 193 incorporates NFPA 59A-2001, therefore you must comply with the requirements in NFPA 59A-2001. Likewise, where there is a conflict between the requirements of Part 193 and NFPA 59A-2001, the regulations in Part 193 apply.

PHMSA provides written clarifications of the Federal pipeline safety regulations in the form of interpretation letters. These letters reflect the agency’s current application of the regulations to the specific facts presented by the person requesting the clarification. Interpretations are not generally applicable, do not create legally-enforceable rights or obligations, and are provided to help the specific requestor understand how to comply with the regulations.

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

Sincerely,

**JOHN
A
GALE** Digitally signed
by JOHN A
GALE
Date:
2020.04.23
14:59:32 -04'00'

John A. Gale
Director, Office of Standards
and Rulemaking



COMMONWEALTH LNG

January 6, 2020

Office of Pipeline Safety (PHP-30)
Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590-0001

Attention: Mr. John Gale
Director, Standards and Rulemaking Division (PHP-30)
E22-336 PHMSA HQ

RE: Liquefied Natural Gas Full Containment Storage Tanks

Dear Mr. Gale,

Pursuant to Section 3 of the Natural Gas Act, (“NGA”) Commonwealth LNG, LLC (“Commonwealth”) proposes to construct and operate a natural gas liquefaction and export facility in Cameron Parish, Louisiana. The Liquefied Natural Gas (“LNG”) Facility will be located on the west side of the Calcasieu Ship Channel, near its entrance to the Gulf of Mexico.

The LNG Facility is proposed to have 6no. 40,000 cubic meter full containment LNG tanks. Commonwealth’s preliminary full containment tank design is proposed to have the below parameters:

- Nominally 165 ft high
- Nominally 131 ft diameter
- Primary (internal liquid container) tank wall of 9%Ni steel
- Secondary (outer liquid container) tank wall of 9%Ni steel
- Reinforced concrete with a grillage steel base

The design Standards and Codes are per API and NFPA 59A. The design basis and tank design summary are included in Section 2 of the attached “*Compliance Review of Proposed LNG Storage Tank Design*”.

Please note that the NFPA 59A (2019) Standard allows, for a Full Containment Tank System, that the secondary (i.e. outer) liquid container and roof, be constructed either from metal or of prestressed concrete. Clause A.3.3.5.4.2 refers. Please also note that the secondary metal 9%Ni container wall is suitable for exposure to cryogenic temperatures. Additionally, the preliminary design of the secondary LNG container considers missile impact criteria per the Nuclear Regulatory Commission Regulatory Guide 1.221 (NRC RG 1.221) i.e.:

- Automobile (4,000 lbs., 122 mph)
- Schedule 40 pipe (287 lbs., 117 mph)
- Solid steel sphere (1-inch diameter 0.147 lbs., 103 mph)
- Pipe valve (110 lbs., 121 mph)



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Calculations substantiating the secondary container design for the missile impact are found in Appendix B1 of the attachment. Calculations substantiating localized cryogenic spills are found in Appendix B2 of the attachment. Adopting a robust metallic secondary container for missile impact appears to comply with all design requirements, without compromising safety. The secondary (outer) container will therefore be liquid tight under the spill of the primary container or external missile impact conditions.

Commonwealth notes that 49 CFR §193 incorporates by reference NFPA 59A (2001), whereas the current NFPA 59A is dated 2019. Furthermore, 49 CFR §193.2161, and 49 CFR §193.2167, extracted below, appears to be a prescriptive requirement that the secondary container be of concrete, in apparent conflict with the NFPA 59A (2019).

49 CFR §193.2161 Dikes, general.

“An outer wall of a component served by an impounding system may not be used as a dike unless the outer wall is constructed of concrete.”

49 CFR §193.2167 Covered Systems.

“A covered impounding system is prohibited except for concrete wall designed tanks where the concrete wall is an outer wall serving as a dike.”

The reasoning for this specific material requirement is not stated, however it appears that this concrete material was primarily for withstanding aircraft impacts scenarios, as per 49 CFR §193.2155 (c), (1996). This requirement has been withdrawn from later revisions to 49 CFR §193, where LNG storage tanks must not be located with one mile of the nearest point of a runway. Please see page 15 of the attachment for further information

Commonwealth concludes that the LNG Storage Tank design fulfills the safety objectives of NFPA 49A (2019). The secondary liquid container fulfills the functionality and definition of a Full Containment Tank, as per NFPA 59A Clause A.3.3.5.4.2 “Full Containment Tank System”, where the secondary container is capable of both containing the liquid product and controlling vapor resulting from evaporation in the event of product leakage from the primary liquid container. It is a robust design suitable for use, further details are found in Section 4 of the attachment. Commonwealth therefore requests, pursuant to 49 CFR §193.11, “Availability of Informal guidance and interpretive assistance”, specifically part (b) “availability of written interpretations” that DOT PHMSA clarify that our secondary container design material complies with the intent of both 49 CFR §193.2161 and 49 CFR §193.2167, and therefore provide a written regulatory interpretation, and concur that it suitable for use. If you have any further design criteria, please advise.

Commonwealth has reviewed the Tank design with respect to the other relevant Clauses of 49 CFR §193. This document “Compliance Review of Proposed LNG Storage Tank Design”, is attached. This contains a listing of the 49 CFR §193 Clauses, as well as the NFPA 59 A (2001) and (2006) Clauses applicable to the LNG Storage Tank design, our review outcome, and associated notes on these matters. The attached also includes Drawings of the preliminary design, as well as the preliminary calculations for “Windborne Missile Impact Preliminary Assessment” and “LNG Jet Thermal Shock Assessment”.



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Should you require further discussion or information please contact either Mr. Allcock via telephone or email per the below. The Commonwealth team is available to meet in your offices at a time to suit your schedule.

Commonwealth looks forward to the interpretation of 49 CFR §193.2161 and 49 CFR §193.2167.

Yours faithfully,

Scott Ray
Senior Vice President Engineering & Permitting

Please address all correspondence to:

Jonathan Allcock
Commonwealth LNG,
1 Riverway,
Houston, TX 77057
Office: 346 352 4440
Mobile: 713 205 5521
Email: jallcock@teamcpl.com

Encl: Compliance Review of Proposed LNG Storage Tank Design