U.S. Department
of Transportation

Pipeline and Hazardous Materials
Safety Administration

1200 New Jersey Avenue SE
Washington DC 20590

APR - 9 2019

Mr. Georg H. Breuer
LNG Product Manager
6100 South Yale Avenue
Suite 1200
Tulsa, OK 74136

Dear Mr. Breuer:

This is in response to your letter to the Pipeline and Hazardous Materials Safety Administration (PHMSA) requesting an interpretation of 49 CFR §§ 193.2001 and 193.2007. Specifically, you asked if and to what extent a liquefied natural gas (LNG) facility would be subject to 49 CFR Part 193 regulations.

In the request letter, you stated that Linde Engineering North America (Linde) has developed a cryogenic process integrating LNG production into a natural gas liquids (NGL) recovery process. You described the proposed facility as follows:

> This process integration allows potentially for a higher recovery and throughput rate in the NGL plant increasing the ethane and propane recovery… In addition, this process facilitates the small-scale production of LNG (nominal capacity of 150,000 gpd) at efficiencies equal to the higher efficiencies of large-scale LNG production plants.[1]
>
> [F]or the purpose of the required interpretation the facility accommodating the NGL recovery process shall be already existing, and either one, or both of the feed and residue gas pipelines connecting to, or from the facility (according to 49 CFR 193.2007 "pipeline facility") shall be subject to the pipeline safety laws (49 U.S.C. 60101 et seq.) and to 49 CFR 192 (reference is being made to 49 CFR 193.2001 (a)).
>
> With regard to the boil-off gas from the LNG storage, it shall be noted that the volumetric flow rate of this stream is only in the magnitude of 0.1 - 0.4% of the volumetric flow rate of the residue gas generated by the NGL recovery process. The LNG product from the storage is loaded on trucks to be sold in the merchant market.
>
> Any boil-off gas from the storage of the cryogenic LNG product is compressed and mixed with the residue gas stream of the NGL recovery process. The resulting gas stream is then further compressed and being discharged as residue gas of the NGL process.

[1] A diagram and a process flow sketch are provided to illustrate the processes.

On September 19, 2016, you provided the following additional information via e-mail communications:

> Understanding that the LNG facility used in the transportation of gas by pipeline being subject to the pipeline safety laws and Part 192, there are two cases of interest:
>
> > (1) The feed gas would be from a Part 192 regulated pipeline, or
> > (2) In case the feed gas is not from a Part 192 regulated pipeline, the residue gas would be sent to a Part 192 regulated pipeline.

You also stated:

> If the feed gas is not from a 192 pipeline, it would be from a non-regulated gathering line. The NGL coming out of the recovery process will be intermediately stored and subsequently transported by truck, rail or pipeline to be further used.

Analysis

Section 193.2001 establishes the scope of Part 193. It states that the requirements of Part 193 apply to LNG facilities used in the transportation of gas by pipeline that is subject to Federal Pipeline Safety Laws and regulations, 49 USC 60101 *et seq.* and 49 CFR Part 192. *See* 49 CFR § 193.2001(a). The regulation also contains a list of exceptions that create further limitations on the applicability of the Part 193 requirements to LNG facilities. *See* 49 CFR § 193.2001(b).

Additionally, § 193.2007 defines *LNG facility*, *LNG plant*, and *Pipeline facility*, as follows:

> *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.
>
> *Pipeline facility* means new and existing piping, rights-of-way, and any equipment, facility, or building used in the transportation of gas or in the treatment of gas during the course of transportation.

Regarding questions presented in your letter, we answer them as follows:

(1) Whether the LNG plant would be regulated under the 49 CFR Part 193 requirements?

For this question, you presented two scenarios. In first scenario, you indicated that the feed gas would be delivered to the NGL plant from a regulated Part 192 pipeline, and in the second scenario, the feed gas would be delivered to the NGL plant from an unregulated pipeline, such as a non-regulated gathering line.

In your letter, you described the feed gas as entering the NGL plant, where it is processed and treated. After processing and treatment, the natural gas is sent from the NGL to the LNG plant

for liquefaction via a Part 192 pipeline. Thus, regardless of whether the feed gas is delivered to the NGL plant from a Part 192 pipeline or a non-regulated gathering line, it leaves the NGL plant via a Part 192 pipeline and enters the LNG facility from a Part 192 pipeline, therefore, making the LNG facility subject to the Part 193 regulations because it is used in the transportation of gas by pipeline.

(2) If the LNG plant is regulated, whether the already existing facility accommodating the NGL recovery process would be under the PHMSA regulations?

In this case, the NGL recovery process involves the processing and treatment of feed gas before it enters on the LNG plant. As long as there is a pressure controlling device upstream and downstream of the NGL facility, the existing NGL processing facility is not subject to the pipeline safety regulations (49 CFR Parts 190 – 199), regardless of whether the LNG plant is regulated under 49 CFR Part 193. Specifically, the piping located downstream of the first pressure control device entering the NGL facility and upstream of the last pressure control device leaving the facility, would not be subject to regulatory oversight under PHMSA Part 192 or 195. However, if a pipeline in the facility is predominantly used in transportation to bypass processing, it will be subject to the Federal pipeline safety regulations.

(3) If the NGL facility is regulated, the extent of the applicability, and the required implementation of the respective regulations described in 49 CFR Part 193 for the facility accommodating the NGL recovery process?

As mentioned above, the existing NGL facility would not be regulated by PHMSA under 49 CFR Parts 192, 193 or 195, but if certain pipelines on the facility are predominantly used in transportation to bypass processing, those pipelines will be subject to the Federal pipeline safety regulations. The natural gas (residue) piping exiting the NGL plant downstream of, and including, the last pressure control device leaving the NGL facility would be regulated by PHMSA under 49 CFR Part 192. Additionally, if NGL is transported by pipeline downstream from the NGL facility, then the downstream NGL pipeline would be regulated under 49 CFR Part 195 beginning at the last pressure control device leaving the NGL facility.

To identify the exact demarcation point as a means of clearly delineating regulatory oversight by clarifying boundaries for entering, leaving, and within NGL and LNG facilities, PHMSA suggests that you contact PHMSA's regional office during design phase of your project.

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

Office of Pipeline Safety (PHP-30)
PHMSA
U.S. Department of Transportation
Attn: Kristin Baldwin
1200 New Jersey Avenue SE
Washington, DC 20590-0001

Our Ref.	Phone	Fax	E-mail	Date
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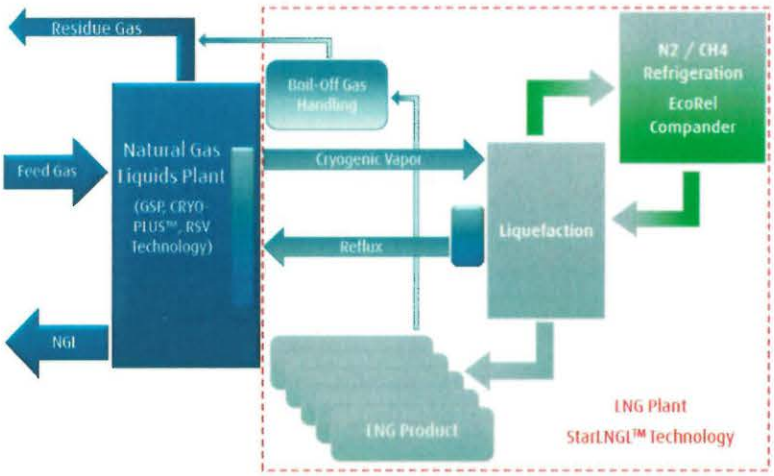
Request for Interpretation of 49 CFR Part 193

Dear Mrs. Baldwin,

This letter is to request written interpretation of wording contained within 49 CFR Part 193 Subpart A - General, specifically concerning 49 CFR §§ 193.2001 and 193.2007.

Linde Engineering North America, Inc. (LENA) has developed a cryogenic process integrating Liquefied Natural Gas (LNG) production into a Natural Gas Liquids (NGL) recovery process. This process integration allows potentially for a higher recovery and throughput rate in the NGL plant increasing the ethane and propane recovery. The higher recovery thereby is depending amongst other things mainly on the feed gas availability. For this product being marketed by LENA as StarLNGL™ currently a patent is pending. In addition, this process facilitates the small-scale production of LNG (nominal capacity of 150,000 gpd) at efficiencies equal to the higher efficiencies of large-scale LNG production plants.

The integration of the StarLNGL™ process technology with the NGL plant and its working principle is illustrated in the Diagram below.

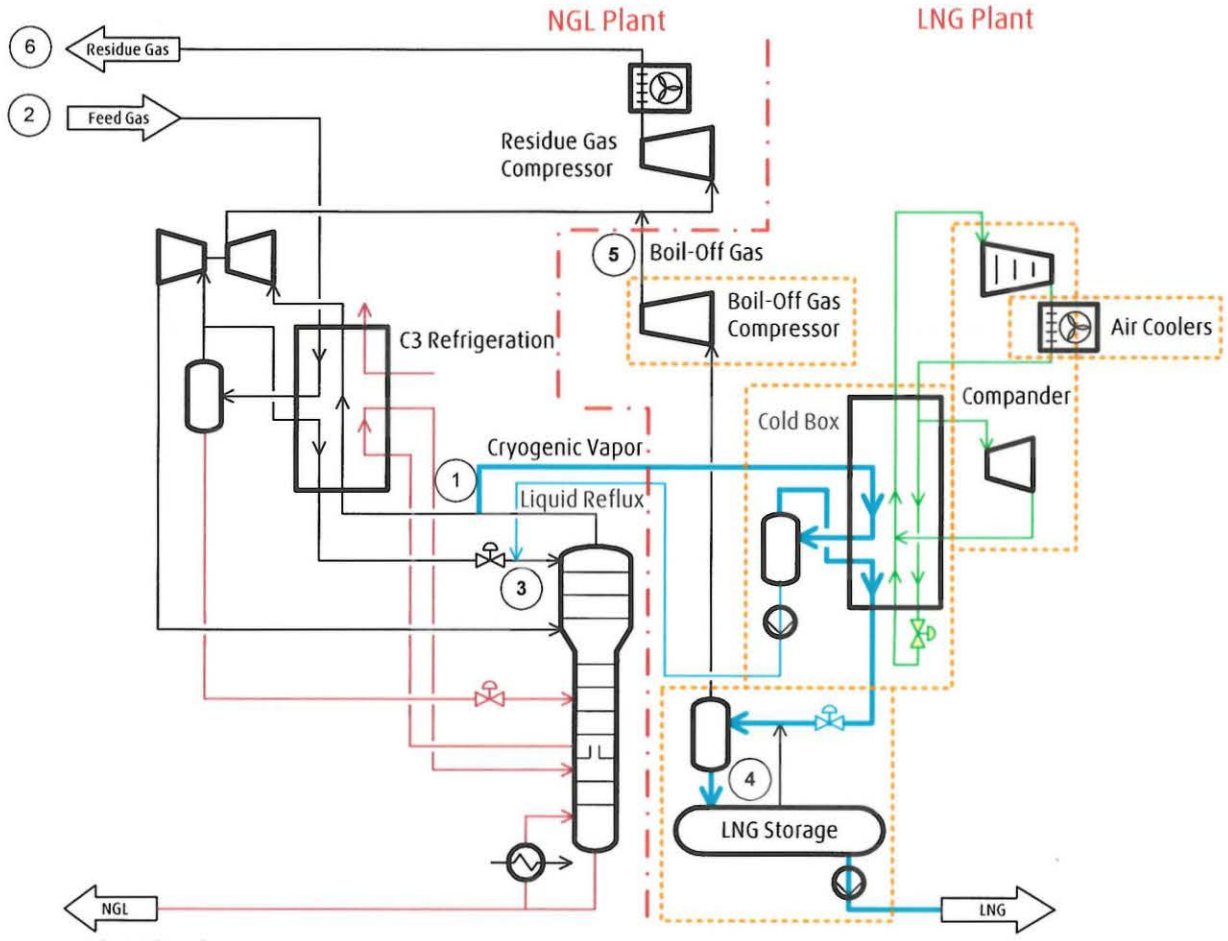


Diagram

Linde Engineering North America Inc.

Houston Office	Tulsa Office	Selas Linde North America	Hydro-Chem
12140 Wickchester Lane	6100 S. Yale Ave	A Division of Linde Engineering North America Inc.	A Division of Linde Engineering North America Inc.
Suite 300	Suite 1200	5 Sentry Parkway East	125 Hickory Springs Ind. Blvd.
Houston, TX 77079	Tulsa, OK 74136	Blue Bell, PA 19422	Canton, GA 30142

The below more detailed Process Flow Sketch in addition highlights the process streams of interest with regard to requested interpretation.



Process Flow Sketch

Generally the StarLNGL™ process uses part of the already cryogenic vapor stream from the demethanizer column of the NGL recovery process (1). The cryogenic vapor stream, being ultimately a product of the feed gas (2) from the NGL recovery process, is subsequently liquefied. The liquid C2+ fraction resulting from this is separated and sent back as "liquid reflux" to the NGL recovery process (3). The C1 fraction, i.e. LNG product is sent to storage (4) with a volume of 3-5 days of continuous production capacity.

Any boil-off gas from the storage of the cryogenic LNG product is compressed and mixed (5) with the residue gas stream of the NGL recovery process. The resulting gas stream is then further compressed and being discharged as residue gas (6) of the NGL process.

A more detailed description of the process may be found in US Patent Application US20140182331A1.

Thereby for the purpose of the required interpretation the facility accommodating the NGL recovery process shall be already existing, and either one, or both of the feed (2) and residue (6) gas pipelines connecting to, or from the facility (according to 49 CFR 193.2007 "pipeline facility") shall be subject to the pipeline safety laws (49 U.S.C. 60101 et seq.) and to 49 CFR 192 (reference is being made to 49 CFR 193.2001 (a)).

With regard to the boil-off gas (5) from the LNG storage it shall be noted that the volumetric flow rate of this stream is only in the magnitude of 0.1-0.4% of the volumetric flow rate of the residue gas generated by the NGL recovery process, that it is being mixed with. The LNG product from the storage (4) is loaded on trucks to be sold in the merchant market.

Request for Interpretation of 49 CFR Part 193

In the light of the stipulations made in 49 CFR 2001 (b) (1) and (2), as well as 49 CFR 193.2007 regarding the definitions "*LNG facility*", "*LNG plant*" and "*Pipeline facility*", LENA is requesting an interpretation, if and to what extent the LNG facility, LNG plant, or pipeline facility will be under the regulation of PHMSA having the authority to establish and enforce safety standards for onshore LNG facilities as described in 49 CFR Part 193.

Specifically:

(1) Will the LNG plant using StarLNGL™ process technology as indicated in above ***Diagram*** be under the regulation of PHMSA as described in 49 CFR Part 193; and

(2) If so, will also the already existing facility accommodating the NGL recovery process as indicated in above ***Diagram*** become under the regulation of PHMSA; and

(3) If so, please identify the extent of the applicability, and the required implementation of the respective regulations described in 49 CFR Part 193 for the facility accommodating the NGL recovery process.

LENA respectfully asks for the above requested guidance by PHMSA at the earliest date possible to allow the further marketing and development of its new product.

If you have any questions, or require further detailed information, please do not hesitate to contact us at your earliest convenience.

Thank you for your assistance.

Sincerely yours,

Georg Breuer

Georg H. Breuer

LNG Product Manager

Natural Gas and Refining