U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

8701 S. Gessner, Suite 630
Houston TX 77074

AMENDED
NOTICE OF PROBABLE VIOLATION
and
PROPOSED CIVIL PENALTY

VIA ELECTRONIC MAIL TO: msmith@freeportlng.com

December 20, 2024

Michael Smith
Chairman and Chief Executive Officer
Freeport LNG Development, LP
333 Clay Street, Suite 5050
Houston, Texas 77002

CPF 4-2024-033-NOPV

Dear Mr. Smith:

From June 9, 2022, through January 25, 2023, a representative of the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), pursuant to Chapter 601 of 49 United States Code (U.S.C.) conducted an onsite investigation of the Freeport LNG Development, LP (FLNG) liquefied natural gas (LNG) facility located on Quintana Island, Texas.

On June 8, 2022, at 11:28 a.m. CDT, an unplanned and uncontrolled release of methane and a boiling liquid expanding vapor explosion (BLEVE) occurred at the FLNG export facility. FLNG experienced an extreme overpressurization resulting in the catastrophic failure of an 18-inch LNG vacuum insulated piping (VIP). The event continued for roughly 9 seconds and resulted in the atmospheric release of approximately 10,000 pounds of flammable vapor, comprised primarily of methane. An estimated 1,600,000 cubic feet of natural gas was released onto the site and did not impact areas outside of the facility. FLNG reported this incident to the National Response Center on June 8, 2022, at 12:36 p.m. CDT.[1]

[1] As a result of the incident, PHMSA issued a Notice of Proposed Safety Order which was resolved in a Consent Agreement and Order. *See* Freeport LNG Development, LP, Consent Agreement and Order, CPF No. 4-2022-051-NOPSO, 2022 WL 3356562 (Aug. 3, 2022).

PHMSA's investigation of the incident determined that the direct cause was an overpressurization of an 18-inch VIP segment that was part of the LNG transfer system between LNG storage tanks and the export dock. The overpressure protection (a pressure safety valve) for this segment was isolated from the piping segment during annual testing on April 26, 2022. The overpressure protection was not restored to the segment after annual testing. FLNG unknowingly isolated a segment of the 18-inch VIP that was partially filled with LNG and, for five days, the LNG warmed, expanded, and substantially increased the pressure within the 18-inch VIP until an overpressurization occurred, rupturing the pipeline, and resulting in a mechanical explosion with a cascading series of multiple piping failures within the shared pipe rack.

The explosion was caused by contact between flammable vapor (methane) and an ignition source (open and damaged electrical conduits and circuitry) in the pipe rack immediately following the overpressurization. The approximate size of the explosion and fireball was 450 feet high and 350 feet wide and lasted for approximately 5-7 seconds. Following the explosion, a fire occurred from the burning of pooled LNG from the damaged pipes. The fire from the pooled LNG burned for approximately 30 minutes and was in the LNG trough that runs along the elevated pipe bridge northeast of an LNG tank. There was also particulate laden smoke in the area due to the burning of insulation materials on piping, trench walls, and cable sheathing. The initial pipe failure and explosion, together with the subsequent displacement of and damage to other process piping, instrumentation, wiring, and pipe rack structures, caused severe damage to additional process equipment and associated piping in adjacent areas within and near the pipe rack.

In addition, as part of the corrective actions in the Consent Agreement and Order, FLNG engaged IFO Group to conduct a Root Cause Failure Analysis (RCFA).[2]

As a result of the investigation, it is alleged that you have committed probable violations of the Pipeline Safety Regulations, Title 49, Code of Federal Regulations (CFR).[3] This amended Notice replaces the Notice that was previously issued on November 26, 2024.[4] The items investigated, and the probable violations are:

[2] A redacted copy of the RCFA is publicly available here: https://www.phmsa.dot.gov/foia/ifo-group-rcfa-report.

[3] With respect to Items 1, 2, 3, and 4, as part of a Consent Agreement and Order in CPF No. 4-2022-051-NOPSO, FLNG implemented corrective actions that addressed the issues identified in the operating procedures, alarm set points, valve controls, and recognizing and reacting to abnormal operating conditions. Therefore, this Notice does not propose a Compliance Order.

[4] This amended Notice removed potentially sensitive information but did not otherwise substantively change any of the facts or allegations.

1. § 193.2513 Transfer procedures.

(a) Each transfer of LNG or other hazardous fluid must be conducted in accordance with one or more manuals of written procedures to provide for safe transfers.

FLNG failed to have written procedures to provide for safe transfers of LNG in accordance with § 193.2513(a). Specifically, the LNG loading operating procedures, *LNG Storage Tank Operating* (Rev. 1, Jan. 26, 2021), failed to include provisions to prevent the unintentional isolation of a pipe segment filled with LNG. This procedure allowed the digital control system (DCS) operator to unwittingly isolate LNG in transfer lines during operations resulting in the DCS operator closing two valves that, unbeknownst to FLNG or the DCS operator, isolated LNG in a pipe segment. To ensure safe operation during transfer, § 193.2513(a) requires that FLNG provide personnel with clear valve operation instructions to prevent unsafe LNG transfer operations.

Pursuant to the procedures, the DCS operator was required to open or close certain valves to meet the parameters in the DCS logic programs to start a tank pump and begin the transfer of LNG from the storage tank to an LNG carrier ship. Certain valves were not specified within the procedures to be open or closed to meet the DCS logic programs' requirements to perform transfer operations. One such valve with an unspecified open/closed position was closed by the DCS operator on the 18-inch VIP at 8:22:00 a.m. (CST) on June 3, 2022. Immediately after the closure of this block valve, the temperature in the 18-inch VIP began increasing, causing LNG in the line to start vaporizing to an LNG tank. That same day, at 4:44:00 p.m., the DCS operator closed a second valve that also did not have a specified open/closed position under this particular operating procedure. Closing this valve, unbeknownst to the DCS operator, isolated a segment of the 18-inch VIP that was partially filled with LNG between the two valves. The LNG trapped in the 18-inch VIP continued to warm and boil for about five days which increased the pressure to 1,313 psig (from a starting pressure of 37 psig) and resulted in an overpressurization, natural gas vapor cloud release, boiling liquid expanding vapor explosion (BLEVE), and subsequent fire from pooled LNG at 11:28:21 a.m. (CST) on June 8, 2022.

This violation was a causal factor in the incident reported on June 8, 2022.

Therefore, FLNG's transfer procedures failed to provide for safe transfers of LNG in accordance with § 193.2513(a).

2. § 193.2507 Monitoring operations.

Each component in operation or building in which a hazard to persons or property could exist must be monitored to detect fire or any malfunction or flammable fluid that could cause a hazardous condition. Monitoring must be accomplished by watching or listening from an attended control center for warning alarms, such as gas, temperature, pressure, vacuum, and flow alarms, or by conducting an inspection or test at intervals specified in the operating procedures.

FLNG failed to monitor each component in operation or building in which a hazard to persons or property could exist to detect fire or any malfunction or flammable fluid that could cause a hazardous condition in accordance with § 193.2507. Specifically, FLNG failed to monitor the 18-inch VIP to detect increases in temperature that could cause a hazardous condition, such as an overpressurization.

For commissioning purposes only, FLNG installed four inner pipe skin temperature instruments in the 18-inch VIP. These temperature points were intended to aid in the "cooldown" of the pipe to prevent large temperature differences between the top and bottom of the pipe during the cool down. According to PHMSA's investigation and the RCFA, the temperature points were not programmed to send an audible or visible warning alarm to the control center if a temperature setpoint was reached. The data produced by the temperature instruments was automatically logged in a journal by the DCS. However, the exceedances of the temperature parameters did not result in an audible or visible alarm to the control center warning of an overpressure condition. FLNG did not otherwise have an effective means to monitor the temperature in the 18-inch VIP.

This violation was a causal factor in the incident reported on June 8, 2022.

Therefore, FLNG failed to monitor each component in operation or building in which a hazard to persons or property could exist to detect fire or any malfunction or flammable fluid that could cause a hazardous condition in accordance with § 193.2507.

3. § 193.2619 Control systems.

(a) . . . .

(e) Relief valves must be inspected and tested for verification of the valve seat lifting pressure and reseating.

FLNG failed to properly inspect and test relief valves for verification of the valve seat lifting pressure and reseating in accordance with § 193.2619(e). Specifically, after a pressure safety valve (PSV) inspection on April 26, 2022, FLNG failed to verify that its PSV was returned to service after testing (i.e., the inlet isolation valve for the PSV was not re-opened and the appropriate car-seal was not applied).[5] A block valve was closed to isolate a PSV during testing. Since the block valve was not reopened after testing, the PSV remained isolated from the system, and was therefore inoperable and could not relieve pressure in the 18-inch VIP. The 18-inch VIP subsequently ruptured because the PSV could not relieve a pressure buildup caused by the trapped and warming LNG.

This violation was a causal factor in the incident reported on June 8, 2022.

Therefore, FLNG failed to properly inspect and test relief valves for verification of the valve seat lifting pressure and reseating in accordance with § 193.2619(e).

[5] *See* Pipeline Safety Violation Report, Exhibit C4, Picture of PSV (June 10, 2022).

4. § 193.2713 Training: operations and maintenance.

(a) Each operator shall provide and implement a written plan of initial training to instruct -

(1) All permanent maintenance, operating, and supervisory personnel -

(i) . . . .

(iii) To carry out aspects of the operating and maintenance procedures under §§ 193.2503 and 193.2605 that relate to their assigned functions; and

FLNG failed to provide and implement a written plan of initial training to instruct all permanent maintenance, operating, and supervisory personnel to carry out aspects of the operating and maintenance procedures under §§ 193.2503 and 193.2605 in accordance with § 193.2713(a)(1)(iii). Specifically, FLNG failed to train personnel on recognizing and responding to abnormal operating conditions (AOCs) as required § 193.2503(c).[6]

According to its training records, FLNG failed to provide training on recognizing AOCs specific to LNG facilities regulated under 49 CFR Part 193. Because FLNG personnel had not received training on recognizing AOCs at LNG facilities under § 193.2503(c), they did not recognize the cause of, or respond appropriately to, the AOC (the trapped and warming LNG in the 18-inch VIP) that progressed into the reportable incident on June 8, 2022.

This violation was a causal factor in the incident reported on June 8, 2022.

Therefore, FLNG failed to provide and implement a written plan of initial and recurring training to instruct all permanent maintenance, operating, and supervisory personnel to recognize abnormal operating conditions required by § 193.2503(c) in accordance with § 193.2713(a)(1)(iii).

Proposed Civil Penalty

Under 49 U.S.C. § 60122 and 49 CFR § 190.223, you are subject to a civil penalty not to exceed $266,015 per violation per day the violation persists, up to a maximum of $2,660,135 for a related series of violations. For violation occurring on or after January 6, 2023 and before December 28, 2023, the maximum penalty may not exceed $257,664 per violation per day the violation persists, up to a maximum of $2,576,627 for a related series of violations. For violation occurring on or after March 21, 2022 and before January 6, 2023, the maximum penalty may not exceed $239,142 per violation per day the violation persists, up to a maximum of $2,391,412 for a related series of violations. For violation occurring on or after May 3, 2021 and before March 21, 2022, the maximum penalty may not exceed $225,134 per violation per day the violation persists, up to a maximum of $2,251,334 for a related series of violations. For violation occurring on or after January 11, 2021 and before May 3, 2021, the maximum penalty may not exceed $222,504 per violation per day the violation persists, up to a maximum of $2,225,034 for a related series of violations. For violation occurring on or after July 31, 2019 and before January 11, 2021, the

[6] 49 C.F.R. § 193.2503(c) requires each operator to follow one or more manuals of written procedures that include provisions for recognizing and responding to abnormal operating conditions.

maximum penalty may not exceed $218,647 per violation per day the violation persists, up to a maximum of $2,186,465 for a related series of violations. For violation occurring on or after November 27, 2018 and before July 31, 2019, the maximum penalty may not exceed $213,268 per violation per day, with a maximum penalty not to exceed $2,132,679.

Also, for each violation involving LNG facilities, an additional penalty of not more than $97,179 occurring on or after December 28, 2023, may be imposed. For each violation involving LNG facilities, an additional penalty of not more than $94,128 occurring on or after January 6, 2023 and before December 28, 2023 may be imposed. For each violation involving LNG facilities, an additional penalty of not more than $87,362 occurring on or after March 21, 2022 and before January 6, 2023 may be imposed. For each violation involving LNG facilities, an additional penalty of not more than $82,245 occurring on or after May 3, 2021 and before March 21, 2022 may be imposed. For each violation involving LNG facilities, an additional penalty of not more than $81,284 occurring on or after January 11, 2021 and before May 3, 2021 may be imposed. For each violation involving LNG facilities, an additional penalty of not more than $79,875 occurring on or after July 31, 2019 and before January 11, 2021 may be imposed. For each violation involving LNG facilities, an additional penalty of not more than $77,910 occurring on or after November 27, 2018 and before July 31, 2019 may be imposed.

We have reviewed the circumstances and supporting documentation involved for the above probable violations and recommend that you be preliminarily assessed a civil penalty of $ 1,540,800 as follows:

Item number	PENALTY
Item 1	$ 385,200
Item 2	$ 385,200
Item 3	$ 385,200
Item 4	$ 385,200

Response to this Amended Notice

This amended Notice is issued in accordance with 49 C.F.R. § 190.207(c). Any response you may have submitted to the original Notice is no longer applicable. You must respond as set forth below.

Enclosed as part of this amended Notice is a document entitled *Response Options for Pipeline Operators in Enforcement Proceedings*. Please refer to this document and note the response options. All material you submit in response to this enforcement action may be made publicly available. If you believe that any portion of your responsive material qualifies for confidential treatment under 5 U.S.C. § 552(b), along with the complete original document you must provide a second copy of the document with the portions you believe qualify for confidential treatment redacted and an explanation of why you believe the redacted information qualifies for confidential treatment under 5 U.S.C. § 552(b).

Following your receipt of this amended Notice, you have 30 days to respond as described in the enclosed *Response Options*. If you do not respond within 30 days of receipt of this amended Notice, this constitutes a waiver of your right to contest the allegations in this amended Notice and authorizes the Associate Administrator for Pipeline Safety to find facts as alleged in this amended Notice without further notice to you and to issue a Final Order. If you are responding to this amended Notice, we propose that you submit your correspondence to my office within 30 days from receipt of this amended Notice. The Region Director may extend the period for responding upon a written request timely submitted demonstrating good cause for an extension.

In your correspondence on this matter, please refer to **CPF 4-2024-033-NOPV** and, for each document you submit, please provide a copy in electronic format whenever possible.

Sincerely,

BRYAN JEFFERY LETHCOE

Digitally signed by BRYAN JEFFERY LETHCOE
Date: 2024.12.20 11:31:58 -06'00'

Bryan Lethcoe
Director, Southwest Region, Office of Pipeline Safety
Pipeline and Hazardous Materials Safety Administration

Enclosures: *Response Options for Pipeline Operators in Enforcement Proceedings*

cc: Shaw C. Ottis. Senior Vice President, General Counsel & Secretary, Freeport LNG Development, LP, sottis@freeportlng.com
Michael Stephenson, Regulatory Compliance Manager, Freeport LNG Development, LP, mstephenson@freeportlng.com
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