



U.S. Department
of Transportation

**Pipeline and
Hazardous Materials Safety
Administration**

8701 S. Gessner, Suite 630
Houston, TX 77074

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 29, 2019

Michael S. Smith
Chairman & CEO
Freeport LNG Development, L.P.
333 Clay Street
Suite 5050
Houston, Texas 77002

CPF 4-2019-3002S

Dear Mr. Smith:

Enclosed is a Notice of Proposed Safety Order (Notice) issued in the above-referenced case. The Notice proposes that you take certain measures to ensure facility safety with respect to Freeport LNG Development, L.P.'s Export Facility located on Quintana Island, Texas. Your options for responding are set forth in the Notice. Your receipt of the Notice constitutes service of that document under 49 C.F.R. § 190.5.

We look forward to a successful resolution to ensure liquefied natural gas facility safety. Please direct any questions on this matter to me at (713) 272-2847.

Sincerely,

Mary L. McDaniel, P.E.
Director, Southwest Region
Pipeline and Hazardous Materials Safety Administration

Enclosure: Notice of Proposed Safety Order

cc: Mr. Alan K. Mayberry, Associate Administrator for Pipeline Safety, OPS, PHMSA
Ms. Linda Daugherty, Deputy Associate Administrator for Field Operations, OPS, PHMSA

Mr. Mark Roscoe, FERC Regulatory Compliance and Warranty Manager, Freeport LNG Development, L.P.

Mr. Michael Stephenson, Regulatory Compliance Superintendent, Freeport LNG Development, L.P.

Mr. Mark Mallet, Vice President, Operations & Engineering, Freeport Development, L.P.

**DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
OFFICE OF PIPELINE SAFETY**

In the Matter of)

Freeport LNG Development, L.P.,)

Respondent)

CPF No. 4-2019-3002S

NOTICE OF PROPOSED SAFETY ORDER

Background and Purpose

Pursuant to Chapter 601 of title 49, United States Code, the Pipeline and Hazardous Materials Safety Administration (PHMSA) has initiated an investigation of the safety of Freeport LNG Development, L.P.'s (FLNG or Respondent) Quintana Island Export Facility following an August 1, 2019, unintended release of natural gas after a piping failure occurred during commissioning.

As a result of the investigation, it appears that a condition exists on your liquefied natural gas (LNG) facility that poses a pipeline integrity risk to public safety, property, or the environment. Pursuant to 49 U.S.C. § 60117(l), PHMSA issues this Notice of Proposed Safety Order, notifying you of the preliminary findings of the investigation, and proposing that you take measures to ensure that the public, property, and the environment are protected from the potential risk.

Preliminary Findings

- The FLNG Export Facility is located on Quintana Island, Texas. The Export Facility includes three parallel liquefaction trains (Trains 1, 2, and 3). Each train is capable of producing approximately 4.4 million metric tons per annum of LNG for export, which equates to a total liquefaction capacity of approximately 1.8 billion cubic feet per day of natural gas.
- The FLNG Export Facility is located in a maritime region adjacent to the Gulf of Mexico, experiences high humidity throughout a major portion of the year, and is subject to tropical storms and hurricanes. The land used to construct the FLNG Export Facility is on Quintana Island separated from the main portion of Freeport, Texas by the Gulf Intracoastal Waterway (GIWW). The FLNG site is low-lying with little elevation difference from the surrounding water and had to be stabilized prior to construction.

- The FLNG Export Facility is located within an ecologically sensitive area and is also near recreational areas that include beaches and waterways used by the public. Additionally, the facility is located on the GIWW. The GIWW stretches from St. Marks, Florida to Brownsville, Texas. It is the nation's third busiest waterway with the Texas portion handling over 58 percent of its traffic.
- The 2010 U.S. Census reported Quintana, Texas had a population of 56. Freeport, Texas, which is just across the GIWW from Quintana, has a population of approximately 12,000 residents. Being on the Gulf of Mexico, the area also attracts recreational visitors and is close to Surfside Beach and Bryan Beach State Park.
- On August 1, 2019, FLNG was performing a cool down operation as part of the steps to commission Train 1 of the newly constructed liquefaction facility. FLNG experienced a failure when attempting to reduce the time required to properly cool down the facility. FLNG flowed high pressure chilled natural gas at approximately 917 pounds per square inch (psig) through bypass piping into piping designed for a maximum operating pressure of 90 psig. The bypass line consequently failed around the area where a branch weld joined the pipes. The failure of the bypass line resulted in an unintended release of natural gas.
- FLNG was in the process of a cool down operation that was outside the design parameters of the system.
- FLNG informed the Federal Energy Regulatory Commission (FERC) of the event the same day, August 1, 2019. FERC notified PHMSA, Office of Pipeline Safety (OPS), Southwest Region staff of the event on August 6, 2019. PHMSA began its initial onsite investigation on August 7, 2019. FLNG did not make notification of the incident to the National Response Center.
- FLNG's preliminary investigation revealed that the piping was subjected to vibration as a result of this operation. A third-party forensic laboratory analysis concluded that there were potential issues with the characteristics of the weld and the failed segment of piping had a "lean chemistry." Samples tested for materials verification also indicated the ultimate tensile strength was below the manufacturing standard for piping intended for service subject to 49 CFR Part 193. The failed piping was manufactured by Salzgitter Mannesmann Stainless Tubes (Salzgitter Mannesmann). PHMSA acquired documentation from FLNG indicating there may be approximately 1,408 feet of 6-inch piping from Salzgitter Mannesmann's Heat Number associated with the failed piping installed at various locations throughout the FLNG facility
- FLNG continues to operate the liquefaction train; the liquefaction facility may contain similarly flawed piping that does not meet design specifications.

- The failed piping was seamless stainless-steel pipe manufactured to ASTM/ASME SA312 TP 304/304L Heat No: 301881; Manufactured by Salzgitter Mannesmann in Montbard, France.
- FLNG reported the incident resulted in a release of approximately 315,000 cubic feet of natural gas.
- FLNG provided PHMSA with a failure analysis report conducted by the third party forensic laboratory capturing the results of mechanical and chemical testing. The report found the fracture surface exhibited signs of brittle fracture possibly indicating that the material and/or weld did not possess the characteristics required for cryogenic service.

Proposed Issuance of Safety Order

Section 60117(l) of Title 49, United States Code, provides for the issuance of a safety order, after reasonable notice and the opportunity for a hearing, requiring corrective measures, which may include physical inspection, testing, repair, or other actions, as appropriate. The basis for making the determination that an LNG facility¹ has a condition or conditions that pose a pipeline integrity risk to public safety, property, or the environment is set forth both in the above-referenced statute and 49 C.F.R. § 190.239, a copy of which is enclosed.

After evaluating the foregoing preliminary findings of fact and considering the hazardous nature of the product, the temperature and pressure conditions required by the process, the characteristics of the geographical area where the LNG facility is located, the circumstances that resulted in the failure, and the likelihood that the issues could affect the safety of other areas of the LNG facility, it appears that continued operation of the affected LNG Facility without corrective measures may pose an integrity risk to public safety, property, or the environment.

Accordingly, PHMSA issues this Notice of Proposed Safety Order to notify Respondent of the proposed issuance of a safety order and to propose that Respondent take measures specified herein to address the potential risk.

Response to this Notice

In accordance with § 190.239, you have 30 days following receipt of this Notice to submit a written response to the official who issued the Notice. If you do not respond within 30 days, this constitutes a waiver of your right to contest this Notice and authorizes the Associate Administrator for Pipeline Safety to find facts as alleged in this Notice without further notice to you and to issue a Safety Order. In your response, you may notify that official that you intend to comply with the terms of the Notice as proposed, or you may request that an informal consultation be scheduled (you will also have the opportunity to request an administrative hearing before a safety order is issued). Informal consultation provides you with the opportunity to explain the circumstances

¹ Section 190.239 applies to “a particular pipeline facility [that] has a condition or conditions that pose a pipeline integrity risk to public safety, property, or the environment.” An LNG facility is defined in § 193.2007 as “a pipeline facility that is used for liquefying natural gas or synthetic gas or transferring, storing, or vaporizing liquefied natural gas.” Therefore, LNG facilities are subject to § 190.239.

associated with the risk conditions alleged in the notice and, as appropriate, to present a proposal for a work plan or other remedial measures, without prejudice to your position in any subsequent hearing. If you and PHMSA agree within 30 days of informal consultation on a plan and schedule for you to address each *Identified Risk Condition*, we may enter into a written consent agreement (PHMSA would then issue an administrative consent order incorporating the terms of the agreement). If a consent agreement is not reached, or if you have elected not to request informal consultation, you may request an administrative hearing in writing within 30 days following receipt of the Notice or within 10 days following the conclusion of an informal consultation that did not result in a consent agreement, as applicable. Following a hearing, if the Associate Administrator finds the facility to have a condition that poses a pipeline integrity risk to the public, property, or the environment in accordance with § 190.239, the Associate Administrator may issue a safety order

Be advised that all material you submit in response to this enforcement action is subject to being 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).

In your correspondence on this matter, please refer to CPF **4-2019-3002S** and for each document you submit, please provide a copy in electronic format whenever possible.

Proposed Corrective Measures

Pursuant to 49 U.S.C. § 60117(l) and 49 C.F.R. § 190.239, PHMSA proposes to issue to FLNG a safety order incorporating the following remedial requirements with respect to its Export Facility located on Quintana Island, Texas:

1. ***Complete Inventory.*** Within 30 days of the date of the Safety Order, FLNG must submit to the Director, Southwest Region (Director), a complete inventory of piping installed in the liquefaction project using the Heat Number(s) associated with the failed 6-inch piping, including, but not limited to Heat No. 301881, manufactured by Salzgitter Mannesmann Stainless Tubes France SAS. The documentation must include for each segment, the P&ID designation, intended service, design and operating pressures.
2. ***Records Verification.*** Within 60 days of the date of the Safety Order, FLNG must submit to the Director a complete evaluation showing the material properties of all inventoried piping and components meet the design specifications. This evaluation must list all pipe segments and components, the location of the pipe segment or component cross-referenced to a piping drawing, the identification numbers (heat and joint or component number), the length, diameter, specified minimum yield strength, wall thickness, service, the associated materials test report, and a statement verifying that each piping or component meets the design specifications. If there are any indications or uncertainty that a pipe segment or component may not meet the design specifications FLNG must replace the pipe segment

or component or perform destructive testing of the materials in question in order to demonstrate that the required materials properties have been met.

3. ***Mechanical and Metallurgical Testing.*** Within 30-days of date of the Safety Order, FLNG must complete additional mechanical and metallurgical testing and failure analysis of the failed 6-inch and branch connection. The testing and analysis, which must be conducted by an independent third-party entity, must include the following:
 - a. Documentation of the complete chain-of-custody for all parties handling, transporting, or otherwise taking possession of the piping and components to be tested, including but not limited to FLNG, contractor(s), transporter(s), consultant(s), and the materials testing laboratory.
 - b. Within 10 days of date of the Safety Order, develop and submit the mechanical and metallurgical testing protocol and the proposed third-party testing laboratory to the Director for approval prior to transportation to the testing laboratory and commencement of testing.
 - c. Prior to beginning the mechanical and metallurgical testing, provide the Director with the scheduled date, time, and location of the testing to allow for an OPS representative to witness the testing.
 - d. Distribute all correspondence, analyses, and reports, whether draft or final, in their entirety, to the Director at the same time they are made available to FLNG.

4. ***Remedial Work Plan.*** Within 90 days following receipt of this Order, FLNG must submit a Remedial Work Plan (RWP) to the Director for approval. The remedial work plan must include actions to remedy any issues identified by Items 1, 2, and 3, above as well as any other *Identified Risk Conditions* determined by the failure analysis and/or internal investigation of the incident. An *Identified Risk Condition* is (1) operating without an approved procedure; and (2) use of piping materials that does not meet design specifications. This includes, but is not limited to, the circumstances that led the Operator to make the decision to operate the facility in manner inconsistent with the design and without proper operating procedures.
 - a. The Director may incrementally approve parts of the RWP without approving the entire RWP.
 - b. Once approved by the Director, the approved RWP increments or entire RWP is considered incorporated by reference into this Safety Order or Consent Agreement.
 - c. The RWP must specify the tests, inspections, assessments, evaluations, and remedial measures FLNG will use to verify the integrity of the Export Terminal. It must address all known or suspected factors and causes of the August 1, 2019 failure.
 - d. The RWP must include the following:
 - i. Integrate the results of the metallurgical testing, failure analysis, and other corrective actions required by this Safety Order with all relevant pre-existing operational and assessment data for the *Identified Risk Condition*. Pre-existing operational data includes, but is not limited to, construction, operations, maintenance, testing, repairs, prior metallurgical analyses, and any third-party consultation information.
 - ii. Determine if conditions similar to those contributing to the failure on

August 1, 2019, are likely to exist elsewhere within the Export Terminal.

- iii. Conduct additional field tests, inspections, assessments, and/or evaluations to determine whether, and to what extent, the conditions associated with the failure on August 1, 2019, are present elsewhere within the Export Terminal. At a minimum, this process must consider all failure causes and specify the use of pressure testing, or other tests, inspections, assessments, and evaluations appropriate for the failure causes.

Note: FLNG may use the results of previous tests, inspections, assessments, and evaluations if approved by the Director, provided the results of the tests, inspections, assessments, and evaluations are analyzed with regard to the factors known or suspected to have caused the August 1, 2019, failure.

- iv. Describe the inspection and repair criteria FLNG will use to prioritize, evaluate, and repair anomalies, imperfections, and other identified integrity threats. Include a description of how any defects will be graded and a schedule for repairs or replacement.
- v. Based on the known history and condition of affected piping and components included in the *Identified Risk Condition*, describe the methods FLNG will use to repair, replace, or take other corrective measures to remediate the conditions associated with the pipeline failure on August 1, 2019, and to address other known integrity threats within the Export Terminal. The repair, replacement, or other corrective measures must meet the criteria specified in 6(d)(iv) above.
- vi. Implement continuing long-term periodic testing and integrity verification measures to ensure the ongoing safe operation of the Export Terminal considering the results of the analyses, inspections, evaluations, and corrective measures undertaken pursuant to the Order.

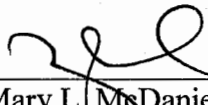
- e. Include a proposed schedule for completion of the RWP.
- f. FLNG must revise the RWP as necessary to incorporate new information obtained during the failure investigation and remedial activities, to incorporate the results of actions undertaken pursuant to this Safety Order, and/or to incorporate modifications required by the Director.
 - i. Submit any plan revisions to the Director for prior approval.
 - ii. The Director may approve plan revisions incrementally.
- g. Implement the RWP as it is approved by the Director, including any revisions to the plan.

- 5. **Procedure Evaluation.** FLNG shall evaluate, using a third-party subject to the Director's approval, the current operations and maintenance manual and the training requirements associated with personnel responsible for operations within the newly constructed Export Terminal. The review must include instructions to properly implement the procedures, and determine that roles and responsibilities are clearly defined. Mandatory personnel training must accompany all revisions to the procedures. This shall be completed within 90 days of the date of the Safety Order.

6. **Reporting.** Commencing on the date of the Safety Order, FLNG shall promptly report to the Director any unanticipated or sustained operation of other components of the plant outside their design parameters. Additionally, on a monthly basis, FLNG shall submit information regarding all available data and results of the testing and evaluations required in this Order, and describe the progress of all actions being undertaken pursuant to this Order.
7. Respondent may appeal any decision of the Director to the Associate Administrator for Pipeline Safety. Decisions of the Associate Administrator shall be final.
8. It is requested (not mandated) that Respondent maintain documentation of the safety improvement costs associated with fulfilling this Safety Order and submit the total to Mary L. McDaniel, Director, Southwest Pipeline and Hazardous Materials Safety Administration. It is requested that these costs be reported in two categories: 1) total cost associated with preparation/revision of plans, procedures, studies, and analyses, and 2) total cost associated with replacements, additions, and other changes to pipeline infrastructure.

The actions proposed by this Notice of Proposed Safety Order are in addition to and do not waive any requirements that apply to Respondent's pipeline system under 49 C.F.R. Parts 190 through 199, under any other order issued to Respondent under authority of 49 U.S.C. § 60101 *et seq.*, or under any other provision of Federal or state law.

After receiving and analyzing additional data in the course of this proceeding and implementation of the RWP, PHMSA may identify other safety measures that need to be taken. In that event, Respondent will be notified of any proposed additional measures and, if necessary, amendments to the RWP or Safety Order.



Mary L. McDaniel, P.E.
Director, Southwest Region
Pipeline and Hazardous Materials Safety Administration

8/29/2019

Date issued