Freeport LNG Incident and Regulatory Response
PHMSA / FERC / USCG
What is LNG?

- Cryogenic
- LNG is natural gas cooled to -260°F and becomes liquid
- Reduces volume 600x for easier storage and transportation
- Does not contain odorant
- Stored at atmospheric pressure
Typical Liquefaction Facility for Export

- Gas Cleanup
- Inlet Natural Gas
- Partially Condensed Refrigerant
- Compressed Refrigerant Coolers
- Refrigerant Compressor
- Refrigerant Gas
- Main Heat Exchanger
- Expansion Valve
- LNG to Storage
- LNG Storage Tank
- LNG Pump
- Boil Off Gas Compressor
- Boil Off Gas to Plant Utility System
- Boil Off Gas to Main Exchanger
- Vapor Return
- Export LNG
- LNG to Storage
- Natural Gas to Main Exchanger
The Freeport Incident

Courtesy Click2Houston.com

PHMSA: Your Safety is Our Mission
The Freeport Incident

Courtesy ABC 13 Houston

PHMSA: Your Safety is Our Mission
June 8, 2022
Captain of the Port
Order 2022-0074

Freeport LNG (GALMS087)
Attn: Mr. Mike Quilty
1500 Lamar Street
Quintana, TX 77551

Subj: CAPTAIN OF THE PORT ORDER 2022-0074—SUSPENSION OF OPERATIONS

On June 08, 2022, U.S. Coast Guard Sector Houston-Galveston received notification of an explosion at Freeport LNG. Due to the nature of the incident and the effect on the facilities operations, you are directed to cease all transfer operations to or from any vessel, as well as all cleaning operations onboard any vessel moored to your facility until the completion of the below requirements.

1. Conduct a risk analysis of the cargo transfer system and related subsystems used in the movement of product to the marine transfer area and submit the finding to the Marine Safety Unit Texas City Facilities Inspection Branch; and

2. Request approval from the Marine Safety Unit Texas City Facilities Inspection Branch before conducting marine transfers.

This order is issued under the authority of the Ports and Waterways Safety Act (Title 46, United States Code (U.S.C.) 70011 et.seq) and the regulations promulgated thereunder Title 33, Code of Federal Regulations (CFR) §§ 160.109 and 160.111. In accordance with 46 U.S.C. 70036(a), failure to comply with this Captain of the Port Order is punishable by a civil penalty of not more than $103,050 for each day the facility is in violation.

This order will remain in effect until you have been notified in writing by Marine Safety Unit Texas City.

Should you be aggrieved by this order, you may request reconsideration of this order to me directly. If I do not rescind this order based on your request, you may appeal my decision to the Commander, Eighth Coast Guard District. While any request or appeal is pending, all provisions of this order remain in effect. All reconsideration requests or appeals must follow the procedures prescribed in 33 CFR § 160.7.
June 30, 2022
Notice of Proposed Safety Order

VIA E-MAIL TO: MSmith@freeportlng.com

June 30, 2022
Michael Smith
Chairman and Chief Executive Officer
Freeport LNG Development, LP
333 Clay Street, Suite 5050
Houston, Texas 77002

Dear Mr. Smith:

Enclosed is a Notice of Proposed Safety Order (Notice) issued by the Pipeline and Hazardous Materials Safety Administration (PHMSA) in the above-referenced case. The Notice proposes that Freeport LNG Development, LP take certain measures with respect to its liquefied natural facility located on Quintana Island, Texas. The options for responding are set forth in the Notice. Service of this Notice by electronic mail is deemed effective upon the date of transmission, or as otherwise provided under 49 C.F.R. § 190.5.

We look forward to a successful resolution to ensure pipeline safety. Please direct any questions on this matter to me at 713-272-2847.

Sincerely,

MARY LOUISE MCDANIEL

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

Enclosures: Notice of Proposed Safety Order
Copy of 49 C.F.R. § 190.239

cc: Ms. Linda Daugherty, Deputy Associate Administrator for Field Operations, PHMSA
Mr. Sigmund Cornelius, President & Chief Operating Officer, Freeport LNG Development LP, SCornelius@freeportlng.com
Mr. Michael Stephenson, Regulatory Compliance Manager, Freeport LNG Development, LP, MStephenson@freeportlng.com
June 30, 2022
Letter requiring written authorization before placing any facilities back into service

June 30, 2022

VIA Electronic Mail

Michael Stephenson, Regulatory Compliance Manager
Freeport LNG Development, L.P.
MStephens@freeportlng.com

Re: LNG Terminal Operation

Dear Mr. Stephenson:

On June 30, 2022, the Department of Transportation’s Pipeline and Hazardous Materials Safety Administration (PHMSA) issued a Notice of Proposed Safety Order (CPF 4-2022-051-NPSP) requiring Freeport LNG Development, L.P. (Freeport LNG) to take certain measures in response to an incident involving a failure of LNG piping at its facilities on June 8, 2022. In addition, on June 9, 2022, the U.S. Coast Guard issued an order (2022-0074) to Freeport LNG suspending all transfer operations to or from any vessel.

Under authority delegated to the Director of the Office the Energy Projects in the June 18, 2004, August 17, 2005, September 26, 2006, May 6, 2009, and July 30, 2014 Commission Orders authorizing construction and operation of the facilities (107 FERC ¶ 61,278; 112 FERC ¶ 61,194; 116 FERC ¶ 61,290; 127 FERC ¶ 61,105; and 148 FERC ¶ 61,076), Freeport must receive written authorization before restarting any non-emergency operations in existing facilities, constructing new or modified facilities, and commissioning and placing any facilities back into service. Such authorization will only be granted following a determination that the facilities are fit for service and acceptable measures have been put into place to safely return facilities to operation.
PHMSA Follow-Up

- August 3, 2022
Consent Order and Consent Agreement

U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

August 3, 2022
VIA ELECTRONIC MAIL TO: Mssmith@freeportlng.com

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

Re: CPF 4-2022-051-NOPS

Dear Mr. Smith:

Enclosed please find a Consent Order incorporating the terms of the fully executed Consent Agreement between the Pipeline and Hazardous Materials Safety Administration (PHMSA) and Freeport LNG Development, LP, which was executed on August 2, 2022. Service of the Consent Order and Consent Agreement by e-mail is deemed effective upon the date of transmission, or as otherwise provided under 49 C.F.R. § 190.5.

Thank you for your cooperation in this matter.

Sincerely,

ALAN KRAMER
MAYBERRY
Alan K. Mayberry
Associate Administrator
for Pipeline Safety

Enclosures: Consent Order and Consent Agreement

cc: Ms. Mary McDaniel, P.E., Director, Southwest Region, Office of Pipeline Safety, PHMSA
Mr. Michael Stephenson, Regulatory Compliance Manager, Freeport LNG Development, LP, MStephenson@freeportlng.com
Mr. Mark Mallett, P.E., Vice President of Operations and Engineering, Freeport LNG Development, LP, MMarkett@freeportlng.com
Thermal Expansion within an LNG line with an isolated pressure relief valve resulted in a Boiling Liquid Expanding Vapor Explosion and Loss Of Primary Containment

The flammable vapor (methane) then met an ignition source resulting in a vapor cloud explosion, a fireball, a small secondary pool fire, and a short-term release of vaporizing LNG from damaged 3-inch piping
Root Causes and Freeport Response

- Pressure Safety Valve Testing Procedure and Car Seal Program
- Safeguards to Warn Operators of Increasing Vacuum Insulated Piping Temperature and/or Pressure for Lines Routinely Isolated by Procedure
- Operating Procedures Allowed for Operators to Routinely Isolate a Section of LNG Line
Contributing Causes and Freeport Response

- Single Layers of Protection for Routine Operations Not Evaluated to Identify Potential Hazards
- Management of Change process for modifications to Procedure-Unit 18 Tank Management
- Abnormal Operating Conditions and Related Hazards
- Operator Fatigue
January 22, 2023
Commence cool down of the Loop 1 LNG transfer piping and reinstatement of Boil-Off Gas Management.
January 23, 2023
Recission to the Captain of the Port Order 2022-0074
PHMSA Response

- **January 26, 2023**
  Approval of 3rd party evaluations and assessments

Approval for Freeport to cool down Loop 1 LNG transfer piping and reinstate Boil-Off Gas Management
January 26, 2023
Commission Loop 1 LNG transfer piping and commission and the reinstate Boil-Off Gas Management System
January 30, 2023
Commence nitrogen cooldown of LNG rundown piping system and introduction of hydrocarbons into LNG Train 3 for commissioning and cooldown.
February 1, 2023
Commence nitrogen cooldown of LNG rundown piping system and introduce hydrocarbons into LNG Train 3 for commissioning and cooldown.
Freeport Incremental Request

- February 1, 2023

Return to Service LNG Loop 1 and Dock / Load LNG ships from Dock 1 LNG berth
Questions