TERMINAL FAILURE

Freeport LNG's chronic problems, pollution and safety violations

Regular failures, rarely a fine, risking thousands of people and the planet

OILFIELD WITNESS





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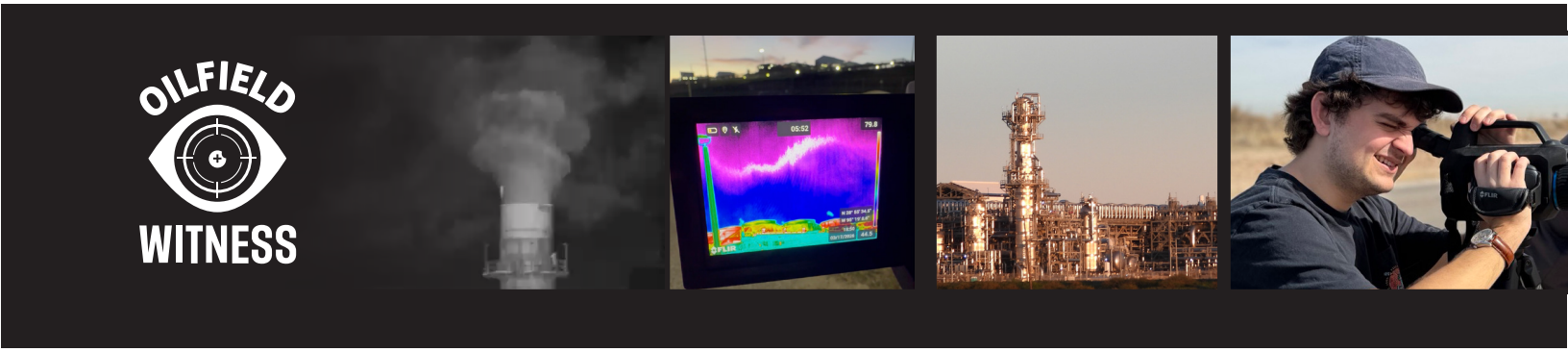
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EXECUTIVE SUMMARY

FREEPORT LNG HAS DEVIATED FROM ITS OPERATING PERMITS 786 TIMES SINCE 2019

Since beginning operations in 2019 Freeport LNG (FLNG), the U.S.'s third largest liquid natural gas export terminal has reported deviating from its operating permit 786 times. In only seven cases have regulators issued fines for any of those deviations; the vast majority never resulted in fines. FLNG does not appear to have solved the widespread mechanical issues at the facility. Instead, FLNG has hired a former employee of the state regulator's office to manage its regulatory reporting. That former regulator, now an FLNG employee, is working on permits for the expansion of operations at the terminal even as some mechanical problems at the existing operation have persisted for five years.

Combining thousands of pages of documents acquired via Public Information Requests with nearly a month of continuous on-the-ground emissions documentation, this report discusses the flagrant errors, conflicts of interest and ineffective regulation that to continue the dangerous conditions and outsized environmental footprint of FLNG. In 2022, there was an explosion at FLNG. A subsequent investigation found that employees may have been missing relevant safety alarms because some alarms for decommissioned equipment were "constantly indicating." Investigators also determined that company management knew about the problems that caused the explosion days in advance but refused to shut down the plant. In the wake of the explosion and subsequent investigation, FLNG committed to making significant operational improvements. Instead, this report finds that FLNG continues to consistently fail to meet regulatory standards with little consequence from state regulators.

Among those compliance problems:

- For multiple years, equipment on site released hundreds of times more pollution than permitted. In fact, emissions from the flares are so large that FLNG reported exceeding its annual flaring limit after just two days during "normal" operation. And at 1500 pounds, its benzene emissions are three times higher than a comparably large terminal.
- One of FLNG's systems was flaring more than 150 times what it was permitted for during the first year of the facility's operation.
- Flares across FLNG's system consistently struggled to achieve regulatory minimum combustion efficiencies and had unlit pilot lights for 941 cumulative hours, likely leading to significantly larger methane emissions than necessary.
- During a 12 hour emissions event in 2022 FLNG flared 11.25 million cubic feet (mmcf) of gas (more than five times the facility's permitted flaring for the entire year). The event was not even caused by a full facility shutdown. It was to purge some equipment for scheduled maintenance.
- On several occasions FLNG observed leaking equipment and appeared to delay repairs for convenience. This has even occurred years after the 2022 explosion.
- Freeport frequently claims to have resolved deviations by adjusting operating parameters, only to report the same problem the following year. Each time, regulators accept the same parameter adjustments that failed to thoroughly resolve the problem previously.

- Before and after the explosion, FLNG had problems with their calibration systems, leading to blackout dates where required calibrations and data recording did not occur. Rather than shutting down during these incidents, operations continued, apparently without proper calibrations.
- Freeport LNG's operations are not stable enough for extreme weather. Hurricane Beryl in 2024 caused outages leading to nearly 60,000 lbs of carbon monoxide being released into the air.
- Regulatory reviews repeatedly find that FLNG fails to report some permit deviations. Rather than punishing this bad behavior, on multiple occasions, FLNG has reported failing to report deviations as a deviation.
- Even seemingly egregious problems such as declining to fix leaks on time and consistent mechanical failures for years have failed to cause regulators to issue fines.

Our findings in this report show that the same cultural disregard for safety and timely repairs that investigators found contributed to the 2022 explosion appear to have continued.

The emissions findings described above are consistent with Oilfield Witness's optical gas imaging footage documenting methane emissions throughout March 2026, and several shorter trips in previous years. Across those trips, Oilfield Witness has consistently documented substantial emissions at both FLNG's Pretreatment Facility and Liquefaction terminal. Oilfield Witness has also observed some emissions events that were not reported to the Texas regulators by FLNG, indicating that the deviations record in the public information request documentation may be a lower limit on Freeport's problems rather than a complete and accurate record. Footage of emissions recorded at FLNG is included throughout this report to visualize the problems described.

FLNG is located in an already at-risk community. It is also a major exporter of natural gas to the EU, which is currently exploring regulations to decrease the environmental toll of its gas imports. The findings in this report paint a stark picture of an out of control operator that is releasing dangerous health impacting pollutants and large concentrations of greenhouse gasses. While the permits for the facility are overly lax, the facility is so poorly managed it is consistently unable to meet its permit obligations. This incompetence is enabled by regulators failing to act on hundreds of permit issues. This facility's continued operation is a danger to the climate and to local residents, and its continued export of LNG to EU member states jeopardizes European climate commitments.



Freeport LNG's pretreatment terminal has multiple sources of emissions documented with optical gas imaging.

INTRODUCTION

Freeport LNG (FLNG) is the third largest liquid natural gas (LNG) export facility in the U.S. With a capacity of over 2 billion cubic feet of gas per day, FLNG can move markets. During outages, when FLNG stops buying gas to liquefy from Texas's fracked shale, the lost demand causes U.S. natural gas prices to drop. Simultaneously, the loss of LNG coming out of FLNG during an outage, causes European gas prices to spike, since Europe is a large importer of U.S. LNG. These effects are so profound that during the first days of the war in Iran, an unrelated outage at FLNG stabilized U.S. gas prices, even as strikes on Qatari LNG facilities caused global LNG prices to skyrocket.

Beyond its influence on global energy markets, FLNG's size also makes it a major source of pollution. The facility is split into a Pretreatment Plant where gas is processed in preparation for being cooled and a Liquefaction Terminal where propane-based refrigerant is used to cool the gas which is then stored and loaded onto ships. The facilities are responsible for large greenhouse gas emissions (carbon dioxide and methane), ozone precursors like nitrogen oxides (NOx) and volatile organic compounds (VOCs); and large concentrations of carcinogenic benzene. The facilities are also in populated areas; many homes in the Freeport community have a clear line of sight to either the pretreatment plant or the terminal. Local residents complain of smells, bright lights and noise from the terminals, and some have noted that there appear to be unusually high cancer rates among their friends and families.

Based on our review of public records and evidence of emissions we documented via optical gas imaging, FLNG does not appear to be committed to "safety, operational integrity and operational excellence," as they claimed.

After a high profile incident in which the Liquefaction terminal partially exploded, launching a fireball over 400 feet in the air, investigations revealed a facility with chronic problems where managers ignored warnings "because they didn't want to acknowledge that there was a problem." The facility's operating issues culminated in the formation of multiple frontline groups to fight the terminal's operation, most notably a local nonprofit called Better Brazoria. In the wake of the explosion, FLNG committed "to emerging from the June 8th incident with an unmatched focus on safety, operational integrity and operational excellence." Based on our review of public records and evidence of emissions we documented via optical gas imaging, that commitment does not appear to have materialized.

Changes in EU policy have also thrust FLNG onto the international stage. The EU, which is the biggest market for LNG in the world, is currently constructing implementation guidelines for the EU methane regulation (EUMR). One of the core requirements of the EUMR is that natural gas imported into the EU achieve a (still unspecified) methane intensity across its entire supply chain. Since methane intensity is the ratio between methane emissions and total throughput, intensity is additive across the supply chain. For example, if a well emits 5% of the gas it produces and a processing plant emits 5% of the gas it processes, then the intensity of gas produced by that well and processed at that plant would be 10%. This is an especially important problem for the U.S. LNG terminals because gas arriving in the EU will always have higher intensity than the terminal that cooled it. Since there are currently only nine major active U.S. LNG export terminals, purchasers looking to comply with the rules have very limited options. As one of the largest terminals in the country, FLNG's climate footprint is a central question for the EUMR's implementation.

Oilfield Witness has visited FLNG four times since 2025 and spent March 2026 filming it dozens of times over a month. After documenting repeated major emissions last year and discussing the facility with members of Better Brazoria, Oilfield Witness decided to use the terminal as a case study for a deep dive into the operations of U.S. LNG. Beyond the month of Optical Gas Imaging footage recorded in March, Oilfield Witness submitted a Public Information Request (PIR) for FLNG's compliance documents at the Texas Commission on Environmental Quality (TCEQ).

Combining the thousands of pages of compliance documents with Oilfield Witness's extensive OGI footage reveals a facility with chronic problems that have persisted well after the explosion:

> **FLNG has reported hundreds of permit deviations, spanning everything from unlit flares to gas releases hundreds of times larger than permitted.**
>
> **In several reports, FLNG admitted to regulators to have discovered leaks at their facilities and then failed to repair them for weeks.**
>
> **FLNG has also continued operations even when the monitoring equipment required by their permits is not working.**

FREEPORT LNG'S HISTORY

The global LNG market has seen major shifts in the past two decades, and FLNG, one of the older major U.S. terminals, has weathered these changes with mixed results. In the early 2000s, the U.S. was a net importer of LNG. Conventional oil and gas production in the U.S. continued but was declining; meeting domestic gas demand required buying gas from foreign countries. Against this backdrop, Cheniere Energy and Smith Entities began developing FLNG as an LNG import terminal. Cheniere would later sell off its stake in the project. Proposed in 2002, the facility began operation in 2008. In the following years, the commercialization of fracking and the Obama administration's lifting of the

Explosion in Freeport

In 2022, less than three years after the facility first began exporting LNG, mechanical failures caused the liquefaction terminal to explode. The explosion sent a fireball over four hundred feet in the air and caused a local beach to evacuate. The investigation by regulators found that the facility was in such disrepair that employees were missing safety alarms because some alarms from decommissioned equipment were "constantly indicating." Investigators also determined that company management knew about the problems that caused the explosion days in advance but refused to shut down the plant. Damage to the facility and ongoing discussions with regulators delayed a return to full capacity until 2024.



A photo of the explosion from a local security camera. Quintana Beach County Park via Facebook.

crude oil export ban, caused U.S. oil and gas production to spike, shifting the U.S. to a net gas exporter. LNG export rapidly expanded, and since 2023, the U.S. has been the biggest LNG exporter in the world. Without quick adaptation, FLNG risked becoming a stranded asset; an LNG import facility in a country that exports LNG.

In response, FLNG undertook a major infrastructure investment campaign to convert into an export facility. That investment cost about $14 billion dollars, as equipment was installed that could take natural gas purchased from fracked shale, treat it and cool it down into Liquid Natural Gas (LNG). Like many LNG terminals, Freeport LNG built multiple complete sets of treatment and liquefaction equipment. Each set is collectively referred to as a "train" and can operate even if another train is offline. The transition took years of permitting and construction, but in late 2019, Train 1, of three, began commercial operations. By May 2020, the facility was fully operational. These transition efforts were so rushed that FLNG actually left its import infrastructure in place, building the export equipment around it. (FLNG is only now petitioning regulators for permission to disassemble that equipment.)

After the export conversion, FLNG now operates three pretreatment trains and three liquefaction trains. The pretreatment trains are linked to the liquefaction trains via pipelines. Each pretreatment train removes impurities such as hydrogen sulfide, water and mercury from its raw natural gas. They also harvest some denser natural gas liquids (NGLs) from the raw gas stream (such as propane and ethane). Each liquefaction train uses a propane refrigerant to cool and compress the natural gas into a liquid where it is then stored in insulated LNG storage tanks until an LNG tanker ship takes it to another country. FLNG has been discussing and working towards installing a fourth pretreatment train and a fourth liquefaction train to expand liquefaction capacity. However, even FLNG's CEO has noted that the project's finances are uncertain, particularly with the ongoing war in Iran.

REGULATING FREEPORT

In Texas, environmental regulations are enforced by the Texas Commission on Environmental Quality (TCEQ). In addition to state level regulations, TCEQ is also charged by the EPA with enforcing the Clean Air Act in Texas. One of the TCEQ's core responsibilities in enforcing the Clean Air Act is issuing air permits to facilities that are releasing air pollution. These permits give operators permission to release greenhouse gasses and health impacting air pollutants. How much they are allowed to release and specific operational requirements vary based both on the facility and its location.

FLNG is located in Brazoria County. The Houston-Galveston-Brazoria airshed has consistently struggled with EPA ozone limits for decades, which means that new facilities in the area are subject to stricter emissions requirements and must purchase offsets for their emissions, so that they do not contribute to further

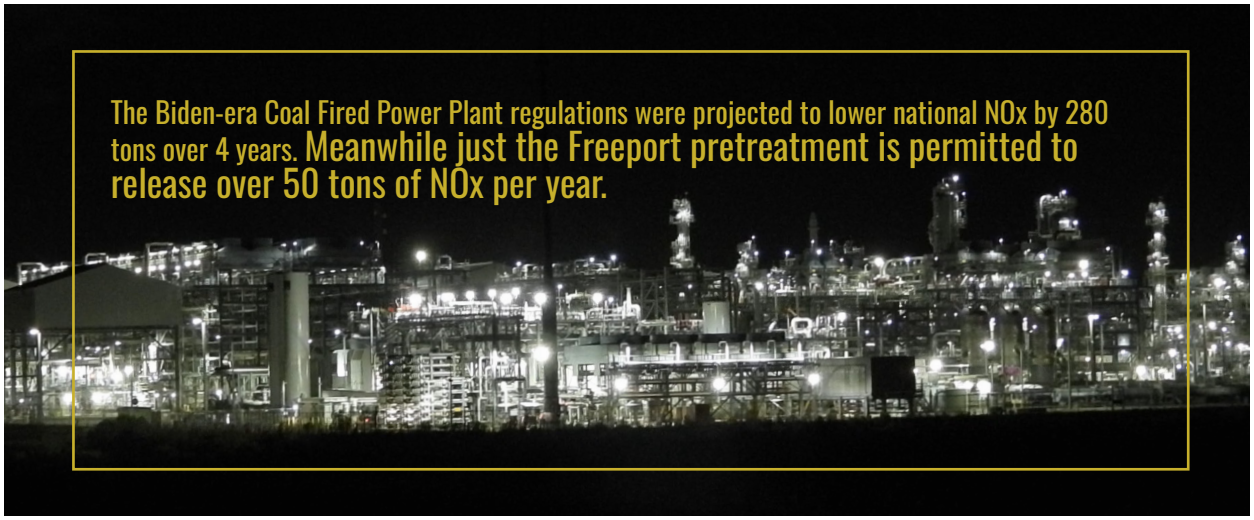


Houston-Galveston-Brazoria airshed has struggled to meet EPA ozone limits for decades. Despite the Brazoria region's existing ozone problems, FLNG is permitted to release over 50 tons of NOx, an ozone precursor, per year.

deterioration of the region's air quality. The central document that permits FLNG's activities is a Federal Operating Permit (or Title V Permit). Despite the name most of the enforcement of these permits is through the TCEQ. FLNG holds two Federal Operating Permits, one for the Pretreatment Facility and one for the Liquefaction Terminal. They also hold state level air permits which are administered by the TCEQ. The permits set limits both on annual emissions and on hourly emissions rates. The approved emissions limits for those permits are listed in the following table.

Regulated Pollution Limits for Freeport LNG (FLNG)	
Pretreatment Plant Emission Limits, Tons per Year	
Volatile Organic Compounds VOCs (including benzene)	23.26
Carbon Monoxide, CO	109.96
Nitrogen Oxide, NOx	45.87
Particulate Matter	80.38
Sulfur Dioxide, SO2	25.17
Sulfuric Acid, H2SO4	1.83
Ammonia, NH3	62.77
Liquefaction Terminal Emission Limits, Tons per Year	
Volatile Organic Compounds, VOCs **(including benzene—see the next page)**	11.66
Carbon Monoxide, CO	10.73
Nitrogen Oxide, NOx	6.03

To put those numbers into perspective, the Biden-era Coal Fired Power Plant regulations, which were touted as a "defining moment" in environmental regulation, were projected to lower national particulate matter emissions by 770 tons and 280 tons of NOx over 4 years, meanwhile FLNG is permitted to release over 50 tons of NOx per year.



Benzene—There is NO Safe Level

Benzene is a Category A known human carcinogen. Exposure to benzene increases your risk of developing leukemia, and current research is exploring the possibility for it to cause the development of other cancers. There is no safe level of benzene exposure which means that any exposure increases your chance of developing cancer. Benzene exposure is commonplace around oil and gas work, and the American Petroleum Institute has known since 1948 that "the only absolutely safe concentration for benzene is zero" and that limits placed on it are "arbitrary."

In 2024, The Pretreatment Plant reported releasing 1,473 lbs of benzene. For a chemical typically measured on the order of milligrams, this is an enormous quantity. Comparatively, Corpus Christi LNG produces more LNG than Freeport FLNG, and released less than one third the amount of benzene at 373 lbs in 2023.

Note: The EPA requires major industrial facilities to report their annual releases of various toxic substances, including benzene, through the Toxic Release Inventory system, where FLNG Pretreatment Plant and Liquefaction Terminal are required to report.

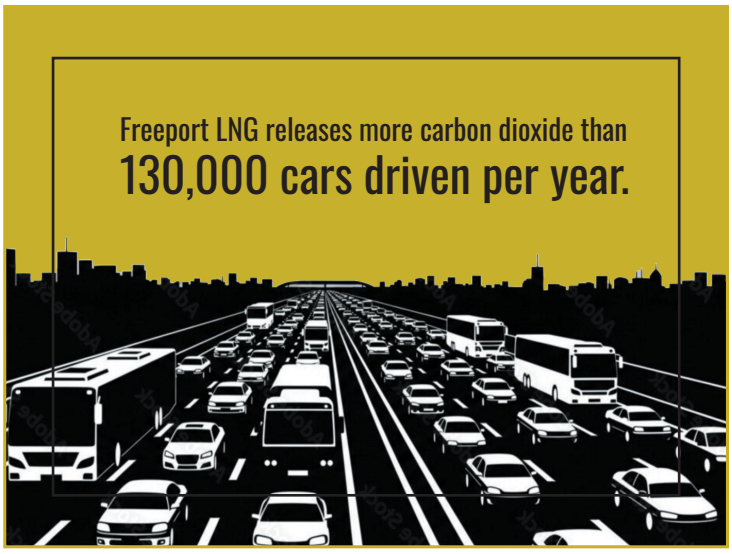
Nationally, about half of the exposure to benzene is from cigarettes, with about .05 mg of benzene per cigarette. In 2024, the Pretreatment Plant released the equivalent of **12 billion cigarettes.**

For the 10,508 residents of Freeport Texas to smoke 12 billion cigarettes, each of them would have to smoke

156 packs per day for a whole year.



The pollutants released by the FLNG facilities span the gamut from carcinogens like benzene to respiratory irritants like particulate matter and sulfur dioxide which both also harm heart function. Sulfur dioxide and sulfuric acid are also major drivers of acid rain. Despite the Brazoria region's existing ozone problems, FLNG is permitted to release over 50 tons of NOx, which is an ozone precursor, per year.



TCEQ does not directly place limits on greenhouse gas emissions from FLNG's two facilities. In fact, state law prohibits TCEQ from regulating greenhouse gasses except where required by the EPA. However, federal regulation does require the facilities to report their greenhouse gas emissions. That data is collected through the Greenhouse Gas Report Program. The most recent data available from the program is from 2023. Unfortunately, the Trump administration is shutting down the reporting program so it is unlikely that more recent data will become available soon. In 2023, FLNG's emissions from the two facilities are in the following table.

Greenhouse Gas Report Program (currently being shut down by the Trump administration)	
Pretreatment Plant Greenhouse Gasses, Year 2023	
Carbon Dioxide, CO2	514,869.5 tons
Methane, CH4	235.05 tons
Liquefaction Terminal Greenhouse Gasses, Year 2023	
Carbon Dioxide, CO2	46,032.3 tons
Methane, CH4	189.97 tons

Even though FLNG exists to cool and ultimately sell natural gas, it actually burns so much natural gas that it releases more CO2 than a gas-fired power plant. Unlike a gas-fired power plant that burns gas to produce power, FLNG burns millions of cubic feet of gas to manage gas composition and pressure, then liquefy the gas. Since FLNG's explosion in 2022 limited operational capacity until 2024, it is likely that the facility's emissions are higher now that it is processing more gas.

In addition to these reporting requirements on overall emissions rates, FLNG's permits also set operational guidelines on things like combustion efficiency at flares and temperatures in heaters. Beyond reporting overall emissions, FLNG is also expected to submit two deviation reports each year which are summarized in an annual report by the TCEQ. In those deviation reports, FLNG is supposed to disclose any instances where it violates the operational requirements of its permits and its plans to solve the problem. If the TCEQ decides that the violation is too flagrant or if FLNG fails to report a deviation that TCEQ catches during an inspection, the TCEQ can issue a violation which can result in fines (TCEQ rarely issues violations and fines are even less common). As part of the Public Information Request, Oilfield Witness received TCEQ's annual deviation reports for FLNG from 2019 to February 2025 (at the

time the most recent full Deviation Investigation completed). These annual reports include both TCEQ documentation and information submitted by FLNG.

Based on those documents, since full export operation began in 2020 until February 2025, FLNG reported 404 different permit deviations at the Pretreatment Facility. There is one year where there is a slight discrepancy between the total given by TCEQ and number reported by FLNG, so there may be up to 408 total deviations at the Pretreatment Facility. Over the same time period, FLNG reported 382 deviations at the Liquefaction Terminal. In total, from 2020 to February 2025, FLNG reported 786 permit deviations at its two facilities. Even in the best year since converting to an export system, FLNG still reported over 100 permit deviations. Notably, many problems only count as one deviation per reporting period even if the problem occurred multiple times during that reporting period, so this number fails to fully capture the scale of noncompliance.

NOx Offsets—Legal but Ineffective

To comply with the Clean Air Act, FLNG is required by the TCEQ to offset its more than 50 tons of NOx emissions each year. To do so, FLNG must purchase NOx offsets from another facility in the Brazoria airshed that has reduced its emissions. FLNG has fulfilled this requirement by purchasing offsets from a brokerage managed by Koch Supply and Trading. Oilfield Witness backtraced those offset certificates and found that they were originally generated by a shipping company called Stolt-Nielsen more than 15 years ago. Stolt-Nielsen did not generate these certificates by reducing emissions at an industrial facility in Brazoria. Instead, Stolt-Nielsen generated these certificates by decreasing emissions from their shipping fleet and then calculating how long their boats idled in the Brazoria airshed that year. In effect, FLNG is claiming that their emissions are being offset by one year reductions in emissions from cargo ships more than a decade ago. While not illegal, that clearly subverts the intention of the offsetting provision.

THE AREA'S AIR QUALITY HAS BEEN MEASURED MULTIPLE TIMES SINCE THESE OFFSETS WERE GENERATED AND HAS BEEN FOUND TO HAVE NONCOMPLIANT OZONE CONCENTRATIONS. The age of FLNG's offsets means that the emissions that FLNG releases are not really being offset by another comparable reduction in emissions because the reductions created by Stolt-Nielsen are already accounted for in current estimates. This means that FLNG is having a negative impact on the area's air quality, despite offsetting regulations existing to prevent that. Unfortunately, this practice is permitted by the TCEQ which mandates that offsets be generated in the same airshed, but not that they be generated around the same time as the emissions they are offsetting nor sets an expiration date for offsets that go unused.

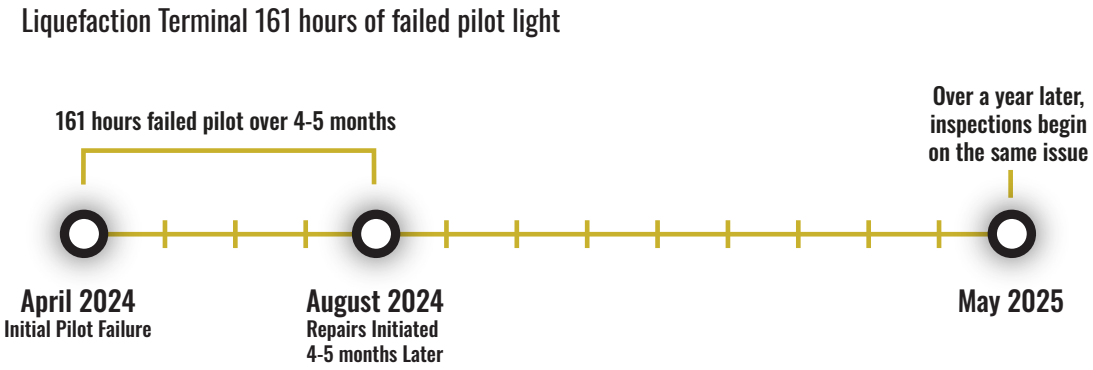
WHAT KIND OF DEVIATIONS DID FLNG REPORT?

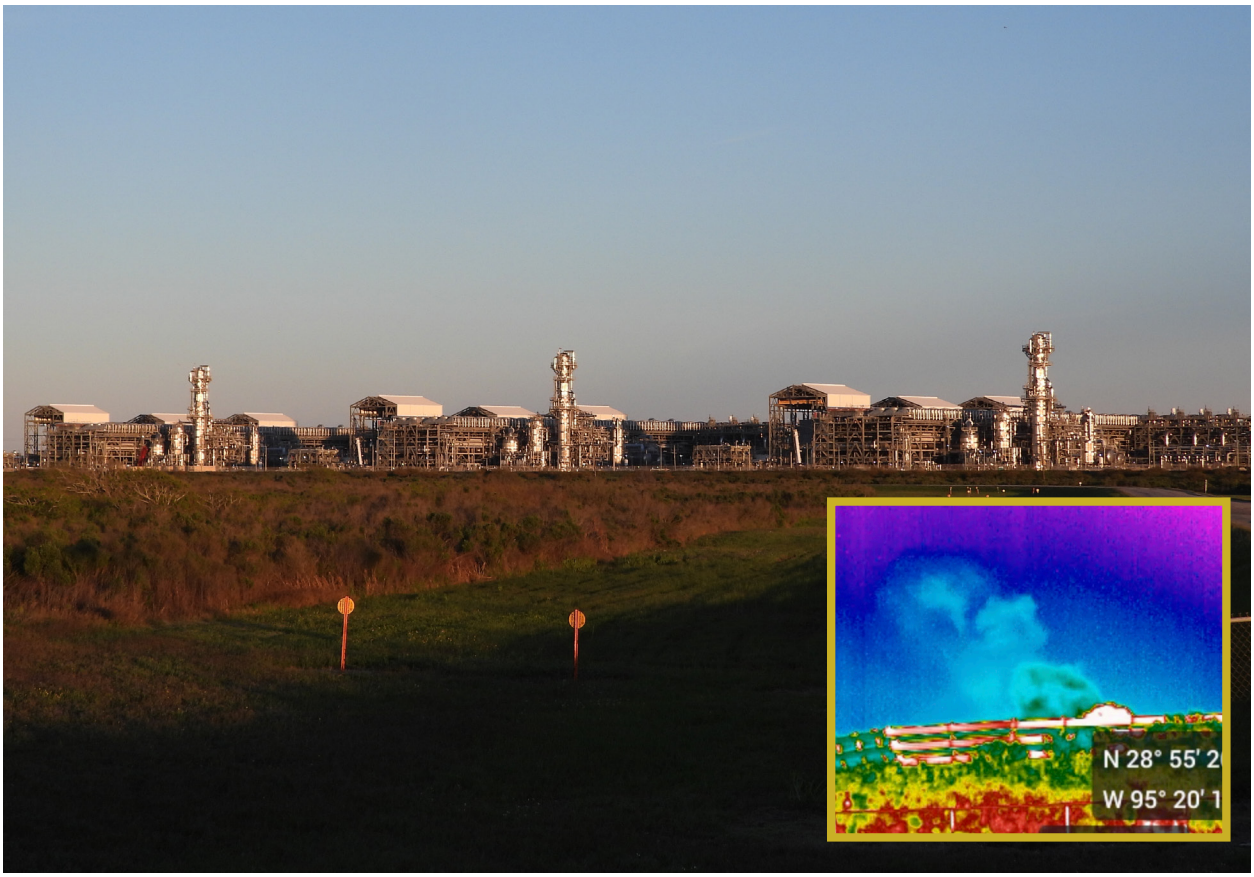
Loss of Pilot Flame: 6 Deviations

Both the Pretreatment facility and the Liquefaction Terminal regulate their gas streams using multipoint ground flares to combust methane and break it down to carbon dioxide, a less potent greenhouse gas. For flares to work properly, the gas sent to the flare must be burned. To ensure that the gas is burned, FLNG's permits require that a pilot light is lit at all times. When the flare's pilot light is unlit the flare can release methane and VOCs directly to the atmosphere. FLNG's flares have some redundancies to keep the flare burning even if the pilot light becomes unlit, but these systems do not always work

Liquefaction Terminal, 161 Hours Loss of Pilot

One of the longer events was reported (pg. 81) at the Liquefaction Terminal over a period from April 2024 to January 2025 (161 hrs) arising from a faulty ignitor system. Repairs were not made until August 2024, five months after the problems began. It is not clear why it took FLNG so long to solve the problem. In its response to TCEQ, FLNG claimed (pg. 38) that "Pilot flames are continually monitored and set to alarm at a loss of pilot to make sure that corrective actions such as re-igniting of pilot flame or repairing of ignitors can be completed in the timely manner." TCEQ found this explanation sufficient to not issue any fines despite also concluding that it took more than five months for repairs to take place which is clearly not timely. When repairs did take place in August, the pilot light went out again due to continued issues with the ignitor, and further inspections did not occur until May 2025, more than a year after the initial problems began.

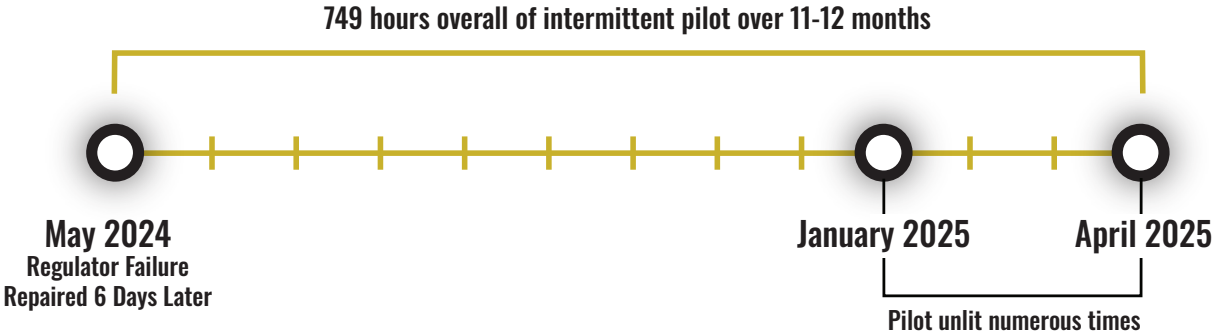




Optical Gas Imaging Footage of the flare at the Liquefaction Terminal taken by Sharon Wilson. The background photo is of the full facility, with the naked eye. The inset photo shows the uncombusted hydrocarbon emissions.

Pretreatment Plant, 749 Hours Loss of Pilot

The largest deviation was 749 hours of pilot light outage from 2024 to 2025 at the Pretreatment Plant. Per FLNG (pg. 295) there were two causes for this issue. In May 2024, a regulator was broken that needed to be repaired. Repairs did not occur for six days. The details provided for the other problem are murky. FLNG stated that its pilot light was unlit intermittently from January 21st, 2025 to April 30th 2025 due to "lighting issues." The correction to this problem outlined by the TCEQ was that FLNG stated that the pilot was relit on April 30th. Since the pilot had been unlit on numerous occasions between January and April, it is not clear what action was taken during each incident, what the root cause of the problem was or if FLNG attempted to relight the system during each incident or only the last.





Optical Gas Imaging footage of the flare at the Liquefaction Plant taken by Sharon Wilson. The gray plume indicates uncombusted hydrocarbons (and therefore inefficient flaring), and includes the greenhouse gas methane and volatile organic compounds.

Exceeding Flaring Volume Limits: 20 Deviations

In addition to regulating the lighting of flares, FLNG's permits also put limits on the overall volume of gas that can be flared at each facility. While FLNG's deviation reports are submitted at the same times every year (February and August), the limits on flaring volume are calculated on a rolling monthly basis. This means that each deviation report includes multiple annual flaring volumes (for example, a 2024/2025 report would include values for 2/23-2/24, 3/23-3/24, 4/23-4/24 all the way to 2/24-2/25). The first reporting period for which the facility was operational for an entire rolling 12 months was 2020-2021. From 2021 to 2025, both facilities exceeded regulated flaring volumes.

Exceedances are also tremendously large. At the liquefaction terminal, the rolling 12 month volume limit is 46.2 mmcf (million cubic feet of gas). At the pretreatment facility, the rolling 12 month volume limit is 2.2 mmcf.

In 2019 and 2020, the liquefaction terminal reported (pg. 73) flaring over 7,000 mmcf for 12 reporting periods. This means the liquefaction terminal was flaring more than 150 times what it was permitted for during the first year of the facility's operation. Operations have improved since then, but are still far in excess of permitted volumes. During the most recent reporting period, the Liquefaction Terminal flared over 300 mmcf (more than six times its permitted volume) over 11 reporting periods.

The pretreatment facility flares less gas but has had similar compliance problems. During 2020, the pretreatment facility reported (pg. 769) flaring over 1,000 mmcf during three reporting periods, exceeding its permit by nearly 500 times. The 2024/2025 deviation report notes that FLNG reported 2 deviations for exceeding permitted volumes but does not include the required supplemental information giving specific volumes. However, the 2023/2024 report (pg. 12) does include the volumes for the deviations and indicates that the pretreatment plant exceeded the volume limits over every reporting period. The lowest volume included in that report is 123.4 mmcf, still more than 50 times the permitted maximum.

In 2019-2020 the liquefaction terminal was flaring more than 150 times its permitted amount.

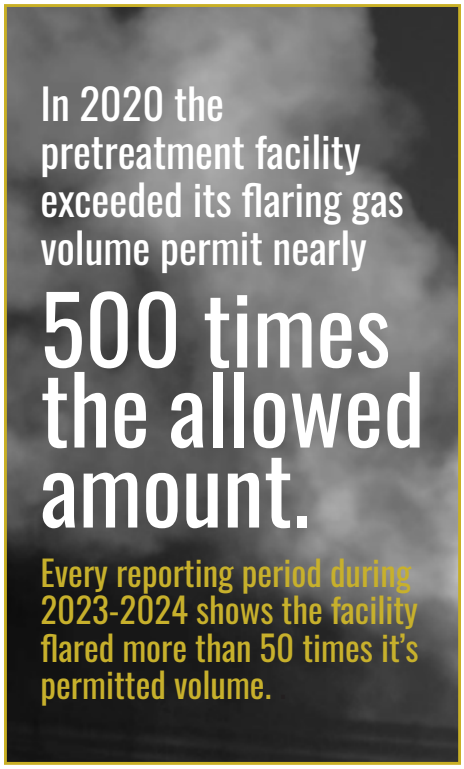
During the most recent reporting period, the Liquefaction Terminal flared more than 6 times its permitted volume over 11 reporting periods.

FLNG is not capable of consistently complying with the limits on flaring set by its permits, and has acknowledged this to the TCEQ since 2022.



Optical Gas Imaging Footage of the flare at the Pretreatment Plant taken by Jack McDonald. The gray plume indicates uncombusted hydrocarbons.

These huge volumes of flared gas also frequently lead to the facility exceeding the emissions limits set in its permit for specific air pollutants. For example, the limit on carbon monoxide for the pretreatment plant's flare (pg. 771) is 3.32 tons per year (using the same rolling 12 month system as flaring volume). For the 2021-2022 reporting period, the pretreatment facility exceeded that for 10 reporting periods, peaking at 381 tons from June 2019 to June 2020.



Clearly FLNG is not capable of consistently complying with the limits on flaring set by its permits. FLNG has even acknowledged this and has been telling the TCEQ since 2022 (pg. 36, pg. 49, pg. 57, pg. 68) that it plans to resolve these problems by installing a flaring reduction system that collects gas and sends it back into the system before it can be flared as well as applying to have a larger flaring permit. The most recent federal operating permit application from FLNG includes documents dated December 2025 that indicate the system was still not operational (pg. 142), but TCEQ continues to allow FLNG to operate while serially violating its permit.

Monitoring Equipment Calibration Problems: 2 Deviations

As part of the requirements to monitor the air pollutants being released by the flare, FLNG uses a Gas Chromatograph Continuous monitoring system. Federal regulation requires that those systems are subject to three different kinds of calibration testing: a simple daily check and more complicated weekly and quarterly calibrations. From February to August 2022, FLNG failed to conduct the weekly and quarterly calibrations, which was reported as a deviation. In its deviation report, FLNG stated that it had contracted a vendor to reconfigure the equipment so that it could carry out the required calibrations.

Even though FLNG did not appear to explain what had gone wrong that led to these calibrations not occurring, TCEQ did not appear to request further information. TCEQ issued a violation for the calibration deviation based on its inclusion in the 2022-2023 deviation report. TCEQ gave FLNG until February 2024 to come into compliance. In response, FLNG cited multiple delays with their vendor. The





Additional optical gas imaging footage at the Pretreatment Plant taken by Jack McDonald.

new calibration system was not fully integrated into their digital platform until September 2024, more than two years after FLNG first reported that it was not conducting calibrations. Operations continued during that time. Notably, while FLNG appears to have been unable to conduct proper calibration across that time period, no calibration deviations were reported after the initial 2022 report. It is not clear to Oilfield Witness how or if calibration was achieved.

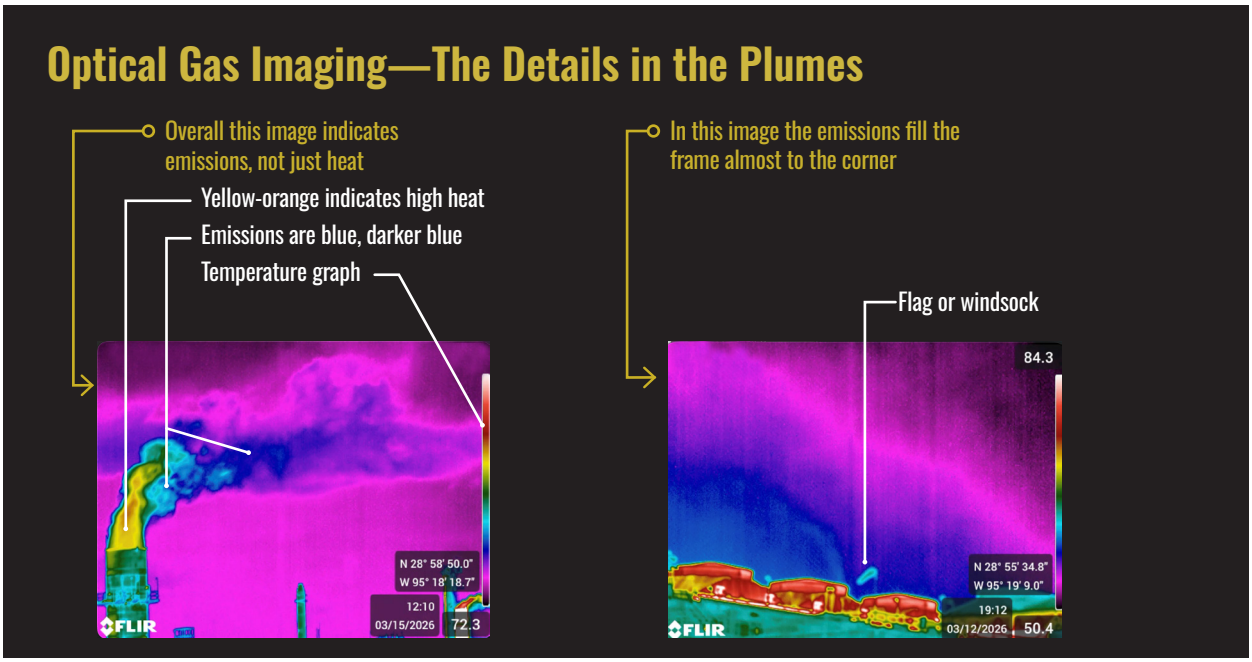
Failing to Repair Leaking Equipment: 6 Deviations

FLNG is required to conduct periodic inspection of equipment to find and repair leaks. Once a leak is found, FLNG is expected to repair the leak in no more than 15 days. This is already a generously long time that TCEQ allows leaks to persist without being addressed, but on six occasions, FLNG let leaks continue for more than 15 days without addressing them. In two cases, FLNG both failed to repair a leak in a timely manner and then failed to disclose that delay.

Explanations for delays were also flimsy. In two cases (pg. 11), FLNG simply said it could not make the repairs due to "operating conditions." In another, FLNG staff stated the delay was because of the "need for maintenance to provide access to the valve." The strangest of these explanations was given for a leak detected in December 2024 at the Pretreatment facility. The leak was detected exactly 15 days before Christmas. FLNG then stated (pg. 41) that due to the holiday they were "unable to garner any onsite support from 3rd party contractors." FLNG did not provide an explanation for why repairs were not conducted in the 15 day interim between the leak's discovery and the holiday.

Continued problems with leak detection are particularly concerning because several incidents occurred after the June 2022 explosion indicating that the trend noted by regulators of staff disregarding or downplaying onsite problems has continued.

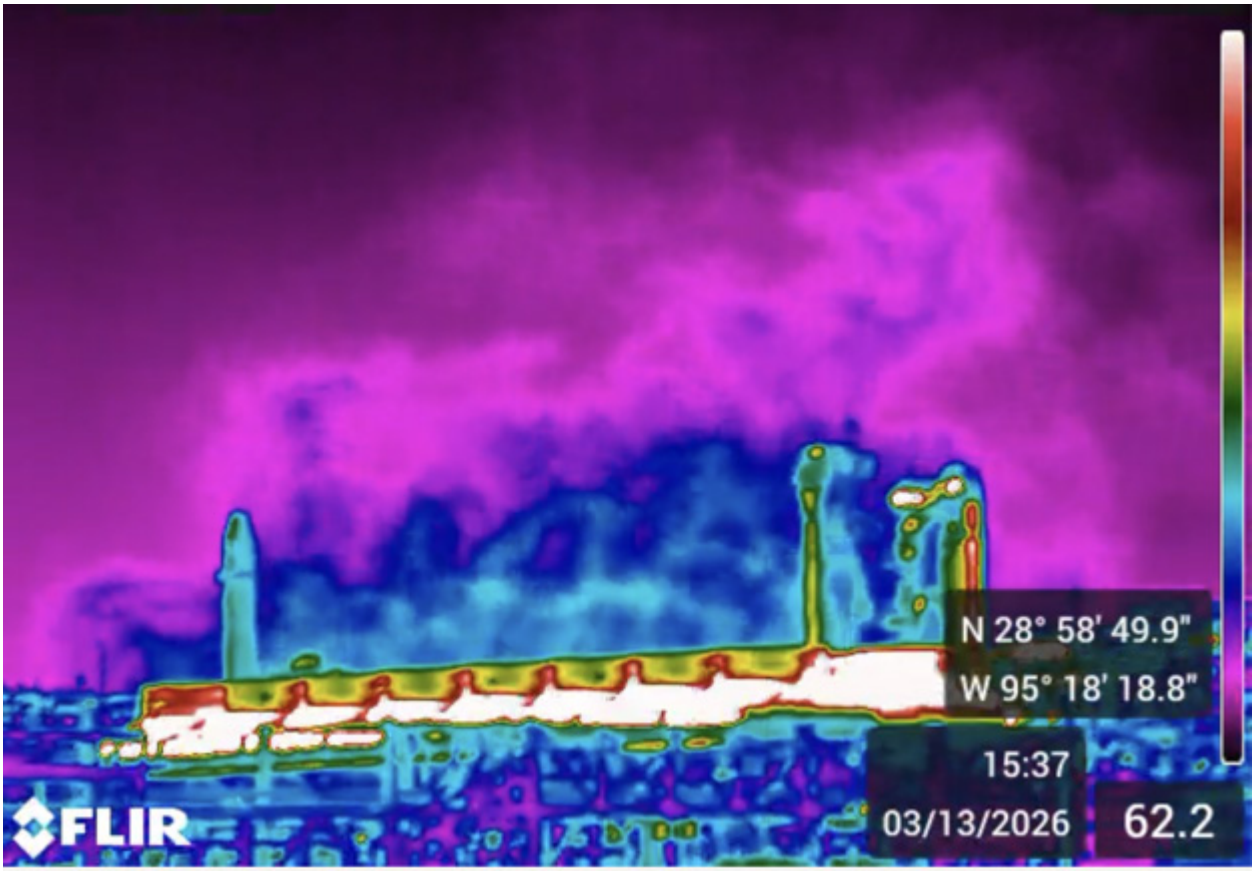
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Emissions Events: 523 Deviations

One of the more controversial elements of Texas's system for enforcing the Clean Air Act is the handling of emissions events. Air permits in Texas are designed under the assumption that equipment is working as intended without outages. However, outages and mechanical problems are inevitable at any industrial facility. Those problems cause emissions which can exceed what is allowed in a facility's air permit. In Texas, companies are required to report these events to the TCEQ if the event causes emission in excess of defined emissions thresholds (these thresholds are set by the TCEQ and independent of the individual facility's permit). As long as the event is not determined to be "excessive" and it is reported on time, TCEQ will not issue violations for emissions events even if the event resulted in the facility exceeding its permit (this practice has been challenged by the EPA as unacceptable in the past). Facilities with federal operating permits also have to report the event in their deviation reports. Emissions events that do not reach the reportable threshold must also be reported as deviations. This leads to a strange system where nonreportable emissions events are expected to be recorded by the company but are not made public nor given to the TCEQ unless requested. In general, to ensure compliance with the rules for nonreportable emissions events requirements, TCEQ requests documentation for a random 5% of the nonreportable events with a minimum of one review.

Emissions events are common at both FLNG facilities, and of the 523 emissions events, 229 exceeded reportable thresholds. In most cases, at both facilities, gas released during emissions events was rout-



Optical Gas Imaging Footage at the Pretreatment Plant taken by Sharon Wilson. The blue and pink plume indicates uncombusted hydrocarbons. Emissions like these are common at the facility, and are often worse during emissions events.

ed to the flare system. The emissions events information has also given useful information about FLNG's flaring problems.

As noted above, the pretreatment facility flare is limited to 2.2 mmcf of gas release annually. However, some individual emissions events reported to the TCEQ were larger than that. For example, on April 5th 2022 FLNG reported (pg. 304) a 12 hour emission event. That single event resulted in 11.25 mmcf of flaring (more than five times the facility's permitted flaring for the year). Notably, the event was not even caused by a full outage. It was to purge some equipment for scheduled maintenance. In another event the same year, FLNG reported (pg. 304) flaring 1.47 mmcf in 12 hours. The only explanation given was that this was "normal operation" and there were "No abnormal flaring events to report" (even though this was reported as an emissions event). The next day FLNG reported another event for 1.31 mmcf over another 12 hours, also calling it "normal operation." In just two days, FLNG exceeded its annual flaring limit just from "normal operation."



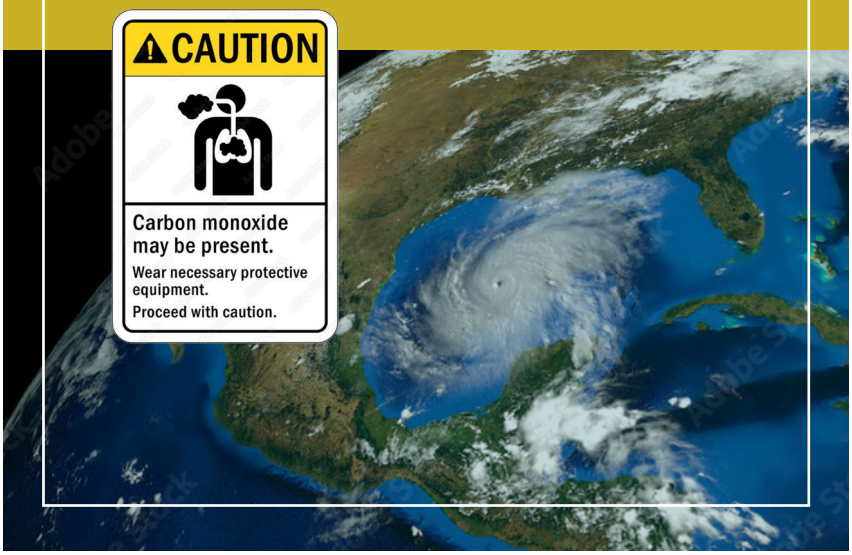
FLNG is planning on installing a flaring reduction project which aims to collect some gas routed to the flare and send it back to the entry of the pretreatment plant (pg. 12). While this is likely to reduce flaring, it is difficult to believe that the project is capable of driving flaring below permitted levels when daily releases are on the order of the annual permit. This seems especially true when some of those single day releases are for equipment purges at the pretreatment facility implying that while they take place the pretreatment facility is operating at diminished capacity.

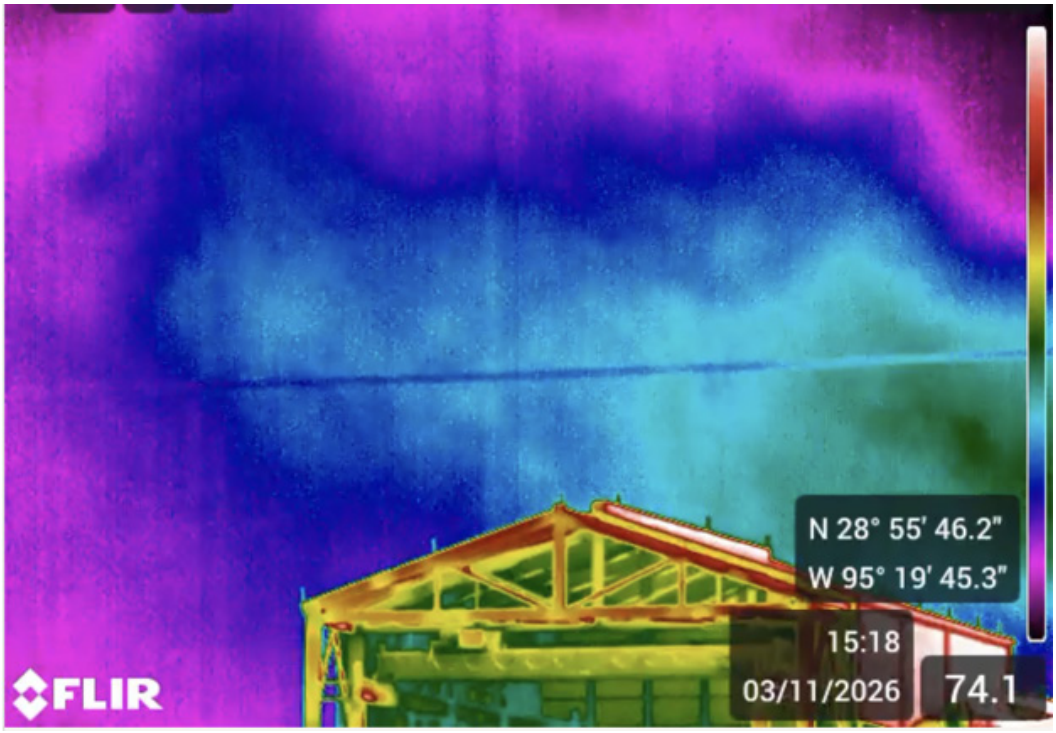
While Oilfield Witness was in Freeport, TX in March, there was a power interruption that led to the pretreatment plant going offline. This led to emissions events at both facilities. Oilfield Witness's Sharon Wilson witnessed the start-up operations at the liquefaction terminal after the pretreatment facility outage on 3/8/26. While the liquefaction terminal reported that the emissions event ended on 3/9/26, in the following days Wilson documented large emissions that appeared to arise from startup operations. It is not yet clear whether those emissions amounted to a reportable event.

The emissions events also reveal unsurprising but still notable severe weather sensitivity for both facilities. The liquefaction terminal in particular is directly on the coast and has reported multiple large emissions events due to hurricane problems. For example, Hurricane Beryl, in 2024, resulted in a 15 day outage at the liquefaction terminal during which gas was flared from the system. The ensuing warm up of LNG led to additional flaring to relieve pressure from the boiling methane. The deviation report package for 2024 does not include the total volume of natural gas flared during these events but the emission event report does give the volume of other air pollutants released from the flare due to the event. Hurricane Beryl's outage released 12,454 lbs of carbon monoxide, 2,906 lbs of propane and 1,871 lbs of NOx. The flaring of boil off gas led to an additional release of 22,501 lbs of carbon monoxide and 2,624 lbs of NOx. Hurricane Beryl also resulted in a 13 day outage at the Pretreatment Facility, during which the plant released 24,680 lbs of carbon monoxide, 3,079 lbs of NOx and 411 lbs of Butane. FLNG apparently cannot handle the severe weather that its emissions are exacerbating.

Uncontrolled Carbon Monoxide

During Hurricane Beryl, FLNG released over 59,000 pounds of carbon monoxide, an extremely hazardous pollutant. Exposure to large volumes of carbon monoxide can be fatal in minutes and nonfatal exposure can lead to severe symptoms including dizziness, nausea and convulsions. To put his volume into perspective, over the course of the event, FLNG released more carbon monoxide than 700 cars over a year.





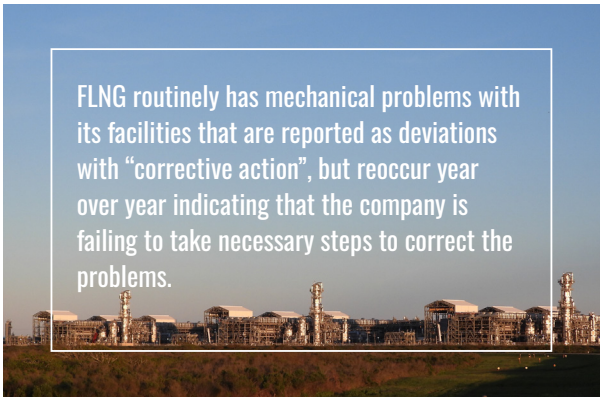
Optical Gas Imaging Footage taken by Sharon Wilson at the Liquefaction Terminal on 3/11/26. The blue, green and pink plume indicates uncombusted hydrocarbons.



Optical Gas Imaging footage of the Liquefaction flare taken by Sharon Wilson on 3/11/26. The light plume indicates that the flare is not completely combusting gas routed to it. The operation of the flare appears related to the startup at the terminal.

Other Mechanical Issues

In addition to testing requirements and direct limits on emissions volumes, FLNG's permits also place performance requirements on specific pieces of equipment. For example, in addition to being lit, the pretreatment plant's flare must achieve a minimum net heating efficiency, designed to ensure that the flare is actually combusting the gas rather than just releasing it. Other parameters regulated by the permits include the pH range and spark rate in thermal oxidizer systems and concentrations of pollutants in turbine exhaust. Across these various parameters, a clear trend emerges. FLNG routinely has mechanical problems with its facilities that are reported as deviations with "corrective action", but reoccur year over year indicating that the company is failing to take necessary steps to correct the problems.



One of the most extreme examples of a recurring problem going unsolved regards exhaust emissions from the FLNG pretreatment plant's heater systems. The facility's permits require that NOx concentrations in that exhaust be below 5 ppm across a one hour average. Since full operation of the facility began, every reporting period FLNG has reported at least 8 deviations of this rule. During the most recent reporting period, those 8 deviations spanned over 70 operating hours. Since 2020, FLNG frequently told the TCEQ with each deviation report that the "corrective action" for these heater problems has been to "adjust" the "operating parameters." Clearly, those adjustments have not been sufficient. FLNG has also told (pg. 8) the TCEQ that when NOx concentrations exceed permitted levels at the heaters, visual and audible alarms go off in the operator control room so that operators can take "immediate action." Heater data is also included in the deviation report and shows NOx concentrations have exceeded permitted levels for up to 16 hours continuously (pg. 110). The continued reporting of deviations and the length of some incidents is concerning given that alarm structure, because it may indicate that FLNG operators are continuing to ignore alarms even after the 2022 explosion.

These heater problems are extreme, but not unique. Another class of equipment that appears to have routine problems are FLNG's thermal oxidizer systems. These systems are designed to remove hydrogen sulfide from the gas stream. Hydrogen sulfide rich gas is often called sour gas or acid gas due to its low pH. FLNG's pretreatment plant has regulations placing limits on pH in the thermal oxidizer system as well as limits on several other technical parameters. The most recent deviation report (pg. 2-4) from the pretreatment plant lists 19 deviations for the thermal oxidizer systems. FLNG blamed these events on a combination of operational issues and variation in the hydrogen sulfide content of the gas stream. However, in the detailed reports from the thermal oxidizer systems it is clear that these problems are not short term intermittent upsets. For example (pg. 205), from 2/15/2025 to 6/30/2025 one of the thermal oxidizers was out of compliance on all but 2 days. In each of the last three reports, FLNG has reported at least five thermal oxidizer deviations. Consistently, FLNG has resolved these problems by making "adjustments" only for the problems to reoccur.

Another consistent deviation reported by FLNG is exceeding emissions concentrations from the onsite turbine at the Pretreatment Plant. The Pretreatment Plant's permit requires that emission

concentrations from its turbine are below thresholds for carbon monoxide (4 ppm), ammonia (10 ppm) and NOx (2 ppm). In the most recent deviation report (pg. 2-4), FLNG reported 6 deviations for the turbine: 2 deviations for exceeding NOx emissions rates, 2 deviations for exceeding ammonia emissions rates and 2 for exceeding carbon monoxide emissions rates. These deviations totaled 21 hours of operations. During peak exceedance, carbon monoxide emissions hit 25.6 ppm, more than six times the limit. Since 2020, the pretreatment plant has reported 29 deviations on turbine emissions.

Paperwork Problems

When full operations began in 2020 at FLNG, the two facilities were plagued with two kinds of problems. Most deviations reported were for actual mechanical problems, like those outlined above: flares exceeding volume limits, heaters failing to achieve optimal combustion, difficulties managing pH in treatment systems, etc. However, FLNG was also reporting deviations arising from paperwork and record keeping problems. Some were as basic as failing to submit paperwork on time. For example, in compliance with Texas rules, FLNG had to prepare and submit a plan to control NOx emissions at the Liquefaction Terminal. The plan seemed to have been forgotten about by FLNG staff, because it was not submitted until months after the deadline on the same day the deviation report was submitted (seemingly indicating that the deviation report deadline reminded them to submit the plan (pg. 7)). FLNG also failed to prepare and submit control plans for their heaters and combustion stacks before their due date (pg. 4).

It is difficult to determine whether reporting has actually improved or TCEQ's investigations into unreported events have become less rigorous.

Similar problems are apparent throughout the early years of FLNG's export business. Within 180 days of start-up at the Pretreatment Facility, FLNG was supposed to conduct performance testing for its thermal oxidizers. That testing (pg. 8) did not occur for nearly a year. FLNG even had to note (pg. 31) in deviations that contractors had accidentally deleted monitoring data. In several cases, while TCEQ was creating the annual Deviation Investigation report, TCEQ agents found that FLNG had failed to record required information at all. Some of these were trivial such as submitting documentation (pg. 5) with the name of the facility but without identification numbers. Others were very serious. When requested by TCEQ (pg. 77), FLNG was unable to provide records for emissions by pollutant and source across more than 2 years. FLNG also could not provide flare volume and emissions for several incidents, nor an estimate of atmospheric venting from October 2019 to February 2021. FLNG was also unable (pg. 75) to provide emissions estimates associated with maintenance activities during five separate months. On at least 15 occasions FLNG had to report deviations for failing to report deviations on older reports or for failing to report deviations on time. Several times, FLNG accidentally submitted the same deviation more than once and had to submit amendments.

In 2023, after being caught by the TCEQ failing to report multiple instances of pilot light outages, seven flaring events, and annual emissions limit exceedances for NOx, carbon monoxide, particulate matter and sulfur dioxide, FLNG made the decision to hire a new "regulatory compliance engineer specializing in air emission tracking and reporting" (pg. 16) and implement a new database. TCEQ considered this a sufficient solution. To fill the role FLNG hired Thong Man. Man is a former TCEQ permit specialist. While working for TCEQ, he worked on permits for major Freeport area facilities, including the DOW Chemical Plant. With FLNG, he now works with his former employer to ensure FLNG's compliance. This revolving door behavior is concerning, especially since FLNG is regulated by the same district office that Man worked in. That TCEQ employees can go on to work for the companies they regulate likely disincentivizes strong regulatory action that could alienate their future employers.

While Man's employment is concerning regarding the integrity of TCEQ's regulations, FLNG has had many fewer deviations and violations for paperwork problems since he began working there. Unfortunately, that improvement does not appear to have extended to FLNG's technical problems. Further, given his prior history with TCEQ, it is difficult to determine whether reporting has actually improved or TCEQ's investigations into unreported events have become less rigorous.

TCEQ PENALTIES

As of July 31st, 2026, FLNG has received 76 violations from the TCEQ, and only seven fines, since export operations began. That is the sum total of enforcement against FLNG across over 30 investigations and nearly 800 permit deviations. The largest fine, and one of the largest fines in TCEQ history, was just $330,750 for emissions due to the June 2022 explosion at the liquefaction terminal. FLNG does not publish revenue figures but Forbes has estimated its revenue on the order of 2.5 billion dollars per year. Using that estimate, TCEQ's fine for the worst U.S. LNG incident since 1975 amounted to about .01% of the facility's annual revenue.

The next largest fine was for $152,173 which was issued in response to major emissions events during the first months of ramp up for the facility in late 2019. Outside of the fine issued related to the explosion, TCEQ has issued no fines to FLNG for any actions taken since 2022. In total, TCEQ has issued just $609,790 in fines since FLNG began export operations, just .024% of Freeport's estimated revenue for one year.

This situation embodies the broad problems with TCEQ enforcement. FLNG's compliance problems are well documented, and the company has admitted to many of them through self-reporting, yet violations are rare and fines are even rarer. Even seemingly egregious problems such as failing to report emissions, losing data, declining to fix leaks on time, consistent mechanical failures and exceeding flaring volumes for years have, in some cases, failed to cause TCEQ to issue fines.

Some pieces of equipment have deviated during every reporting period since the facility began full operation in 2020.

Nearly 800 permit deviations are recorded and TCEQ has caught FLNG failing to report problems on multiple occasions.

Instead, TCEQ focuses on "corrective action", declining to issue fines for most violations if the problem is solved even if the solution fails to address the root cause of the problem. This strange tactic is best understood in the context of FLNG's leak repairs. FLNG has repeatedly reported not fixing leaks within the required timeframe, but TCEQ has not issued fines because it considers each incident corrected once the leak is fixed. No work is done to address the root cause of the delay. This means that delaying leak repairs carries little consequence since fines are unlikely to be levied if the leak is eventually repaired. Similarly, FLNG consistently exceeds its flaring permit, but on each report claims the problem is corrected by noting that they are applying for a larger permit and to install a flaring reduction system. While that system and permit may eventually solve the problem, in the interim, FLNG's decision to continue operations leads to more deviations, but TCEQ has not issued fines for FLNG exceeding permitted flaring volumes from 2021 to present, nor has TCEQ halted operations.



CONCLUSION

As the U.S. expands the production of renewable energy, LNG is increasingly viewed as a lifeline by the fossil fuel industry. In an effort to popularize the use of U.S. LNG, many fossil fuel companies have advertised it as a "sustainable" energy source. Of course not only is it not sustainable, it is polluting globally and locally. Freeport LNG is plagued by significant emission issues, and is one of the largest liquefiers in the U.S. FLNG has exposed the community to large volumes of carcinogens, contributed to local ozone precursors, toxic carbon monoxide, and released hundreds of tons of greenhouse gasses.

Freeport LNG's problems are known to TCEQ regulators, but ignored or allowed.

- The TCEQ has thousands of pages of documents on file recording nearly 800 permit deviations and has caught FLNG on multiple occasions failing to report problems.
- Some equipment has deviated during every reporting period since the facility began full operation in 2020.
- In total these failures have led to only seven fines, with a monetary value of just $609,790 (.024% of one year of revenue).
- The flaring systems at both facilities so consistently exceed their permits by such huge volumes, that FLNG claims that it cannot solve the problem without a larger permit that allows more emissions and permission to install new infrastructure. Rather than shutting down the facility until those changes are made, TCEQ has approved permit amendments to increase allowed emissions.

The explosion in 2022 should have been a wakeup call for FLNG's management and the LNG industry more broadly. The company promised to update staffing practices and significantly enhance safety testing requirements but continues to pollute and endanger the local community. Permit deviations have persisted and onsite real-time monitoring seems to be ignored. Leaks are not always repaired within two weeks (as required).

FLNG's only substantial improvement is more reliably reporting its problems, after being caught making egregious omissions on a deviation report. Though it is difficult to determine if FLNG's improved record-keeping is the result of more leniency being afforded to a former TCEQ coworker-now-FLNG-employee or legitimate improvement.

FLNG's continued operation is a danger to the local community and a categorical failure of regulatory enforcement. The current plans to expand the facility rather than deal with these problems are unacceptable.

We are facing a methane emergency.

There are ample loopholes in the regulations requiring oil and gas producers to eliminate methane emissions, but there are no such loopholes in the laws of physics. Regulation cannot change that reality. That's why the only solution to stop methane emissions from oil and gas production and transportation is to rapidly transition to clean energy and phase out the oil and gas industry completely. The laws of physics, nature, health and economics are demanding action now.

OILFIELD WITNESS

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