

## ACCIDENT INVESTIGATION REPORT

1. OCCURRED

DATE: **11-AUG-2024** TIME: **1910** HOURS

- STRUCTURAL DAMAGE
- CRANE
- OTHER LIFTING
- DAMAGED/DISABLED SAFETY SYS.
- INCIDENT >\$25K **\$112,699.00**
- H2S/15MIN./20PPM
- REQUIRED MUSTER
- SHUTDOWN FROM GAS RELEASE
- OTHER

2. OPERATOR: **Gulf Offshore LLC**

REPRESENTATIVE:

TELEPHONE:

CONTRACTOR: **Production Technology & Service**

REPRESENTATIVE:

TELEPHONE:

3. OPERATOR/CONTRACTOR REPRESENTATIVE/SUPERVISOR  
 ON SITE AT TIME OF INCIDENT:

4. LEASE:

AREA: **VR** LATITUDE:  
 BLOCK: **170** LONGITUDE:

5. PLATFORM: **A**

RIG NAME: **\* WIRELINE UNIT**

6. ACTIVITY:  EXPLORATION(POE)

DEVELOPMENT/PRODUCTION (DOCD/POD)

DECOMMISSIONING

8. OPERATION:

- PRODUCTION  TEMP ABAND
- DRILLING  PERM ABAND
- WORKOVER  DECOM PIPELINE
- COMPLETION  DECOM FACILITY
- HELICOPTER  SITE CLEARANCE
- MOTOR VESSEL
- PIPELINE SEGMENT NO.
- OTHER **Well Test operations**

7. TYPE:

INJURIES:

HISTORIC INJURY

REQUIRED EVACUATION

	OPERATOR	CONTRACTOR
	0	2

LTA (1-3 days)

LTA (>3 days)

	OPERATOR	CONTRACTOR
	0	2

RW/JT (1-3 days)

RW/JT (>3 days)

FATALITY

Other Injury

9. CAUSE:

- EQUIPMENT FAILURE
- HUMAN ERROR
- EXTERNAL DAMAGE
- SLIP/TRIP/FALL
- WEATHER RELATED
- LEAK
- UPSET H2O TREATING
- OVERBOARD DRILLING FLUID
- OTHER \_\_\_\_\_

10. WATER DEPTH: **87** FT.

11. DISTANCE FROM SHORE: **42** MI.

12. WIND DIRECTION:  
 SPEED: **0** M.P.H.

13. CURRENT DIRECTION:  
 SPEED: M.P.H.

14. SEA STATE: FT.

15. PICTURES TAKEN:

16. STATEMENT TAKEN:

POLLUTION

FIRE

EXPLOSION

LWC  HISTORIC BLOWOUT

UNDERGROUND

SURFACE

DEVERTER

SURFACE EQUIPMENT FAILURE OR PROCEDURES

COLLISION  HISTORIC  >\$25K  <=\$25K

On August 11, 2024, at approximately 7:10 p.m., an explosion and fires resulting in the injury of two personnel occurred on the deck of the liftboat Brazos at Vermilion Block 170 A, Right of Use and Easement (RUE) Lease number OCS-G30385, operated by Gulf Offshore LLC. (Gulf). Following a well cleanup and test operation for Vermilion Block 153 Well A002 (bottom hole lease OCS-G-36897), an accumulation of gas ignited on the deck of the liftboat. This incident injured two Production Technology & Services Inc. (PTS) workers, the night supervisor (IP1) and separator worker (IP2), both of whom required evacuation from the liftboat by the United States Coast Guard (USCG). Gulf reported that the wind and sea state were calm.

Gulf hired Laredo Offshore Services' liftboat Brazos to serve as a work deck adjacent to the platform. PTS was contracted to conduct a well cleanup and test operation for Well A002. PTS rigged up a test separator; MBD-103 (separator), a 500-barrel atmospheric tank ABJ-104 (500-barrel tank), a steam generator NAC-106, a steam heat exchanger HBG-102, a 3-inch diaphragm pump (PBA-105), a flare boom, an air compressor, and temporary piping. PTS also rigged up a 200-kilowatt rental diesel generator (generator) with distribution panels to provide power for temporary lighting and a temporary fire water pump.

On the morning of August 11, 2024, at approximately 5:30 a.m., Gulf held a day shift pre-tour safety meeting with PTS, which included a job safety analysis (JSA) and a sequence of planned events for the day. The well test was scheduled to start at 7:00 a.m. and end at 7:00 p.m. The test started at 7:00 a.m. and continued throughout the day. At around 5:30 p.m., the PTS night shift met for the pre-tour safety meeting without the Gulf representative present. The well test concluded at 7:00 p.m., and at 7:05 p.m. the PTS night supervisor began draining the fluids out of the separator to the 500-barrel tank. At 7:10 p.m., the PTS supervisor heard the generator engine speed up, leading to the explosion and fires.

The general alarm sounded on the liftboat, and non-essential workers reported to the muster area. Workers from Laredo, PTS, and Gulf responded to the fire, which was extinguished in approximately 15 minutes using at least one fire water hose from the liftboat and four wheeled fire extinguishers on the work deck. Two PTS workers sustained second degree burns to their face, neck, and hands requiring medical attention. They received first aid in the galley of the liftboat while waiting for evacuation.

At 7:23 p.m., the Gulf representative contacted their field helicopter for an evacuation of the two injured workers, but the helicopter was not in the area. At 7:38 p.m., the Gulf representative then contacted Acadian Ambulance Services for the evacuation. At 7:45 p.m., Gulf notified the Lake Charles District BSEE Well Operations after-hours engineer of the incident. At 7:50 p.m., the Laredo Liftboat Captain contacted the USCG to report the incident. At approximately 8:10 p.m., Gulf was informed by Acadian Ambulance Services that they could only take one injured person at a time, so two flights would have to be flown. At 8:16 p.m., the Laredo Liftboat Captain contacted the USCG requesting an evacuation of both injured workers. The USCG arrived at 10:51 p.m. and hoisted both injured workers into the helicopter, transferring them to a medical facility in Lafayette by 12:14 a.m. on August 12, 2024.

On August 12, 2024, Bureau of Safety and Environmental Enforcement Lake Charles District investigators (BSEE investigators) conducted an onsite incident investigation. During the investigation, BSEE investigators collected statements, requested all JSAs, persons on board (POB), and all pre-tour meeting documentation. BSEE investigators also interviewed PTS, Laredo, and Gulf workers with firsthand knowledge of the incident.

During the interview with the PTS Day Supervisor, BSEE investigators inquired about

the task being performed at the time of the incident. The PTS Day Supervisor explained that the PTS night supervisor was draining fluids from the separator into the 500-barrel tank. He further explained that the common practice for PTS workers was to hold down the level controllers for the water and oil until gas blow-by was heard. When BSEE investigators asked about written procedures for draining fluids out of the separator after the well test, the PTS Day Supervisor admitted there were none in place. BSEE investigators also asked about the presence of gas detection equipment on the work deck during the incident. The PTS Day Supervisor confirmed that all PTS workers were equipped with personal gas detectors provided by PTS. Upon inspection, BSEE investigators found that the detectors were Honeywell BW Clip H2S detectors designed specifically for detecting the presence of H2S gas only.

All workers interviewed mentioned that the generator exploded. They saw flames in the generator enclosure, as well as two to three fires on top of the 500-barrel tank while they were extinguishing the fires. During the interviews, BSEE investigators were informed by the Gulf representative that both Surface Safety Valve 1 and Surface Safety Valve 2 automatically closed when the pneumatic panel emergency shutdown was activated. The subsurface safety valve was manually closed with the wireline hydraulic hand pump.

After the interviews were completed, BSEE investigators began a physical inspection of the work deck and production test equipment. They observed two 33-gallon foam-wheeled fire extinguishers discharged as well as two 300-pound purple-K wheeled fire extinguishers discharged on the work deck.

BSEE investigators observed that the generator enclosure was bowed outward with the side doors open. The door containing the control module was closed, but the glass was blown out. Inside of the generator enclosure there were signs of fire, including melted plastics, wires, and remnants of extinguishing agents from fire extinguishers. BSEE investigators visually inspected the emergency shutdown system electronics and the emergency shutdown air intake shutoff valve but found no indicators to confirm whether the valve was closed or open.

BSEE investigators observed that the master group mode selector switch on the pneumatic panel was in-service with all relays closed and all gauges showing zero pressure. The separator inlet valve was closed with the oil and water outlets also closed. The polyethylene tubing line for the emergency shutdown fire loop had melted near the 500-barrel tank. Additionally, a nitrogen hose was connected from an open ball valve to a check valve on top of the separator.

BSEE investigators then shifted their focus to the top of the 500-barrel tank because of reported fires on top of it. They climbed the ladder and accessed the walkway on top of the tank. While on the walkway, BSEE investigators noticed three 24-inch hatches, each with 5 latch-bolts for securing them in a closed position. As they approached the first hatch, BSEE investigators could smell gas, and the presence of gas was confirmed with a Gulf Offshore handheld gas detector. They could see gas escaping from all three hatches.

BSEE investigators observed that the first and third hatch latch-bolts were all loose. The second hatch had one latch-bolt that was not secured to the hatch, and the other four latch-bolts were also loose. On the walkway, the handrail had areas with black soot and there was a charred manila rope hanging. BSEE investigators noticed an atmospheric vent with a flame arrestor above the 500-barrel tank, and no visual fire damage was observed. The flame arrestor was approximately ten feet above the tank and was installed on a chiksan joint with no valves between the flame arrestor and tank. A pressure safety valve with a set point of 20 psi was visually inspected and showed no signs of fire damage. The distance from the generator to the closest flange on the 500-barrel tank was twelve feet and one inch. The generator was located outside the

classified area as depicted on the area classification drawing.

On August 13, 2024, the Bureau of Safety and Environmental Enforcement Lake Charles District (BSEE) office issued a preservation order for the flame arrestor, 500-barrel tank, and generator. These items were approved to be transported from the liftboat Brazos in Vermilion Block 170 to the Broussard Brothers dock at Intracoastal City in Louisiana.

On August 15, 2024, BSEE investigators traveled to the PTS office in Broussard, Louisiana, to conduct interviews with PTS workers who had left the location after the explosion and fires. Three PTS workers were interviewed, but one refused to participate. All three workers had been in the living quarters area when the explosion and fires occurred. They heard the explosion and then proceeded to their muster area until the fires were extinguished.

BSEE investigators interviewed the PTS Operations Manager (PTS Manager), who confirmed that the separator and the 500-barrel tank are owned by PTS. The PTS Manager also informed the BSEE investigators that the generator was rented from a rental generator company.

BSEE investigators inquired about the process for preparing the 500-barrel tank for the well test. The PTS Manager explained that the tank is equipped with an atmospheric vent and a pressure safety valve set at 20 psi. The three 24-inch hatch O-rings are inspected to ensure they are in good condition, then greased and reinstalled into the hatch covers. The hatches are latched and tightened down, and the tank is filled with water and monitored for leaks.

The BSEE investigators inquired about the process for inspecting the 500-barrel tank at the well site location. The PTS Manager explained that the atmospheric vent and the pressure safety valve are removed for transportation purposes, and then reinstalled once on location. Additionally, the three hatches are re-tightened once on-site due to rough roads and other events that could loosen the latch-bolts during the transportation process. BSEE investigators asked the PTS Manager if there were written procedures for prepping the 500-barrel tank or written procedures for draining fluids from the separator after the well test is completed, the PTS Manager responded that there are no written procedures.

On August 19, 2024, BSEE investigators traveled to Broussard Brothers, Inc. in Intracoastal City, Louisiana, to inspect the 500-barrel tank, the flame arrestor attached to the tank, and the generator. Representatives from PTS and the rental generator company were asked to be present to address any technical questions during the inspection. The BSEE investigators, PTS representatives, and a technician from the rental generator company (technician) arrived at Broussard Brothers, Inc. around 10:00 a.m.

The BSEE investigators inspected the flame arrestor while the PTS representatives erected handrails on top of the 500-barrel tank. The flame arrestor had a dent to the exterior housing; however, the element showed no fire damage and appeared clean and free of obstructions.

The BSEE investigators and the generator technician began inspecting the generator. The enclosure of the generator showed visible bowing, the access doors were tied closed due to damage, and the window in the control module access door was dislodged. The battery was not connected. The engine and generator motor had soot, burned plastic, melted wiring, and extinguishing agents from fire extinguishers. The air filter had been removed from its housing, and both the air filter intake housing and the air filter itself had been sprayed with an extinguishing agent. The generator technician disassembled the air intake to inspect the intake shut-off valve, which was found in the open position.

The generator technician then successfully tested the manual function of the air intake shut-off valve. The technician reconnected the battery to power the control module. The control module displayed alarm codes for Emergency Stop, Air Flap Closed, and Gen Over frequency Shutdown in the event log. Upon opening the inner control module door, they discovered wire coating that started to melt and char, melted wire sleeving, and a charred area on the voltage regulator where a burned varistor was found. The BSEE investigators requested that the generator be relocated to the rental company's facility for a more thorough inspection.

The BSEE investigators and PTS representatives inspected the 500-barrel tank. Each of the 24-inch hatch covers at the top of the tank was inspected, and the O-rings were found absent of fresh grease. The O-rings were then removed from the groove and found to have visible cracks and signs of deterioration. Corrosion was also observed on the seating face of the hatch cover.

On August 26, 2024, BSEE investigators traveled to the rental generator company's facility in New Iberia, Louisiana, for a further inspection of the generator. The BSEE investigators met with the rental generator facility manager, two technicians, and an staff engineer. The focus of the inspection was on the air intake shut-off valve of the diesel engine and its mechanical and electronic functions. The technicians manually activated the air intake valve's mechanical linkage and successfully verified the closure of the valve. However, when they tried to activate the manual electronic emergency stop push button on the exterior of the enclosure the air intake valve failed to close. The technicians then attempted to shut the air intake valve electronically, simulating an automatic emergency shutdown (ESD), but were unsuccessful. Subsequently, the technicians began troubleshooting the issue and discovered that the electronic control module was not functioning correctly. While the technicians were troubleshooting the problem, the staff engineer mentioned that the control module may have water damage, as they had recently encountered a similar issue with a different generator. The electronic control module was removed, and upon inspection, the circuit board showed signs of deterioration and delamination.

BSEE investigators inquired about the process of preparing the generator for rental. The technician explained that the generator was serviced, cleaned, and all settings in the control module were verified. It was also mentioned that the ESD was tested before dispatch. The BSEE investigators requested copies of testing documentation, but the technician stated that the tests were not documented. When BSEE investigators asked about how the generator was tested on-site the technician admitted that the automatic electronic ESD could not be tested without a technician, however the manual electronic emergency stop button could be tested.

On August 30, 2024, BSEE investigators traveled to Berwick, Louisiana, to interview the PTS night supervisor (IP1). The BSEE investigators inquired about the procedures for setting up the 500-barrel tank at the well test location. The supervisor detailed the process of connecting the piping, installing the pressure relief valve, and setting up the atmospheric vent. However, when BSEE investigators asked about checking the three hatches before starting the test, the supervisor stated he could not recall if he had done so.

BSEE investigators inquired about the task that was being performed at the time of the incident. The night supervisor explained that he and IP2 were pressurizing the separator with nitrogen to a range of 150 psi to 200 psi. The pressure was intended to push the water and oil out of the separator into the 500-barrel tank. Their standard practice for emptying the separator involved using a wrench to keep the level controller down in the open position while the fluids drained. Once they heard gas blow-by in the piping, the wrench was removed. IP2 first drained the water, followed by IP1, who drained the oil. Shortly after the oil finished draining, IP1 heard the generator engine speeding up. As IP1 turned to leave the area, he was immediately engulfed in flames. Both injured workers were admitted to the hospital for treatment

of their burn injuries.

The BSEE investigators concluded that the three 24-inch hatches of the 500-barrel tank were not properly latched. The O-rings on the hatches were not maintained, as they were absent of grease, showed visible cracks, and signs of deterioration. After the well test, water and oil were manually dumped from the separator into the 500-barrel tank at a faster rate using nitrogen. The rate at which gas was displaced through the unsealed hatches, combined with calm wind conditions, allowed a gas plume to accumulate near the 500-barrel tank and generator, creating a hazardous atmosphere on the work deck. The gas was then sucked in through the generator's air intake, causing the engine to overspeed as indicated by the displayed over-frequency alarm on the control module. The faulty electronic control module of the generator prevented the air intake shut-off valve from automatically shutting down the engine when it reached its over-frequency setpoint. This led to the engine igniting the gas plume and causing an explosion and multiple fires that had to be extinguished.

18. LIST THE PROBABLE CAUSE(S) OF ACCIDENT:

Equipment Failure

The three 24-inch hatches on the 500-barrel tank were not properly latched allowing gas to escape through the unsealed hatches.

Equipment Failure

The generator's faulty electronic control module prevented the air intake shut-off valve from automatically shutting down the engine when it reached its over-frequency setpoint.

19. LIST THE CONTRIBUTING CAUSE(S) OF ACCIDENT:

Equipment Failure

The O-rings and seating face on the three 24-inch hatches of the 500-barrel tank were not properly maintained.

Work Environment

The calm wind conditions allowed a gas plume to accumulate near the 500-barrel tank and generator, creating a hazardous atmosphere on the work deck.

Management Systems

There were no written procedures for commissioning or decommissioning the temporary well cleanup and test equipment.

Management Systems

There was an inadequate hazard analysis conducted for this situation. None of the JSAs mentioned the potential for a large amount of gas to be released during the emptying of fluids from the separator.

20. LIST THE ADDITIONAL INFORMATION:

N/A

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

Rental 200-kilowatt generator

Explosion and fire damage

ESTIMATED AMOUNT (TOTAL): \$112,699

22. RECOMMENDATIONS TO PREVENT RECURRANCE NARRATIVE:

The BSEE Lake Charles District recommends the Office of Incident Investigations issue a Safety Alert/Bulletin regarding this incident.

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: YES

G-110 DOES THE LESSEE PERFORM ALL OPERATIONS IN A SAFE AND WORKMANLIKE MANNER AND PROVIDE FOR THE PRESERVATION AND CONSERVATION OF PROPERTY AND THE ENVIRONMENT?

Authority: 30 CFR 250.107 Enforcement Actions: C

The three 24-inch hatches on the 500-barrel tank were not properly latched. The O-rings on the hatches had not been maintained; they were absent of grease, showed visible cracks, and signs of deterioration. Additionally, there was corrosion on the seating face of the hatch cover. The improperly latched hatches allowed gas to escape, creating a hazardous environment on the work deck. The gas was then drawn in through the generator's air intake, causing the engine to overspeed and ignite the gas plume on the deck. This led to an explosion and fires, resulting in injuries to two personnel.

G-156 FOR DIESEL ENGINES THAT ARE NOT CONTINUOUSLY MANNED IS AN AUTOMATIC AIR INTAKE SHUTDOWN DEVICE INSTALLED?

Authority: 30 CFR 250.856(b) Enforcement Actions: C

The automatic air intake shutdown device of the generator failed to function properly.

25. DATE OF ONSITE INVESTIGATION:

**12-AUG-2024**

28. ACCIDENT CLASSIFICATION:

26. Investigation Team Members/Panel Members:

29. ACCIDENT INVESTIGATION PANEL FORMED:  
**NO**

OCS REPORT:

27. OPERATOR REPORT ON FILE:

30. DISTRICT SUPERVISOR:

**Beau Boudreaux**

APPROVED

DATE:

**17-DEC-2024**