



Safety Alert No. 498

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Explosion and Fire on Liftboat Injure Workers – BSEE Calls for Enhanced Safety Measures and Emergency Preparedness



Figure 1. Test separator and 500-barrel tank.



Figure 2. Generator.

The Bureau of Safety and Environmental Enforcement (BSEE) recently investigated an explosion and subsequent fire that occurred on a liftboat during well cleanup and testing operations. Two contract workers suffered second-degree burns. This event underscores critical shortcomings in procedural controls, equipment readiness, and emergency response during offshore oil and gas operations.

The explosion was caused by a gas accumulation on the liftboat deck during the draining of fluids from a test separator into a 500-barrel tank (Figure 1). The night supervisor initiated the draining process, and five minutes later, a surge in the generator engine (Figure 2) triggered the explosion and multiple fires. Two contract workers were injured, suffering burns to their faces, necks, and hands. The liftboat's fire suppression system extinguished the fire within 15 minutes.

However, the evacuation of the injured workers faced logistical delays, resulting in their arrival at a medical facility nearly five hours after the incident. This delay underscores

the importance of having robust personnel evacuation and medical response plans in place.

Contributing Factors

An investigation by BSEE identified several procedural and equipment deficiencies:

- No formal procedures existed for draining fluids from separators or preparing the 500-barrel tank for testing.
- Workers relied on hydrogen sulfide (H₂S)-specific gas detectors, which could not detect explosive gas mixtures.
- The generator's air intake shutoff valve control module failed to function, allowing gas infiltration.
- Improperly latched hatches on the tank allowed gas to escape.
- Night shift safety meetings lacked oversight by company representatives, reducing communication effectiveness.
- Workers reported holding level controllers open until gas blow-by was detected, increasing risk to personnel safety and operations.
- Loose hatch bolts on the tank, caused during transport, were not adequately inspected upon arrival.

To prevent similar incidents, BSEE recommends that operators and their contractors, where appropriate, consider the following actions:

- Establish comprehensive written procedures for all critical operations, including draining fluids from separators and preparing tanks for well tests. Regularly review and update standard operating and safety procedures to align with industry best practices.
- Equip workers with multi-gas detectors capable of identifying a wide range of hazardous gases, not just H₂S.
- Install fixed multi-gas detection systems on liftboats and work decks for continuous monitoring.
- Conduct a thorough inspection of vessel hatches to ensure a proper seal.
- Conduct thorough inspections of tanks, generators, and flame arrestors before and after transport to ensure proper function and secure fittings.
- Test the automatic air intake shutoff valve before starting operations, ensuring it functions properly.
- Require operator representatives to participate in all safety meetings to enhance communication and adherence to protocols.

- Conduct comprehensive hazard analyses for all operations, particularly gas handling and fluid transfer. Job Safety Analyses should explicitly address potential gas release scenarios.
- Include emergency response plans in all safety briefings, with an emphasis on safety and medical evacuation logistics and coordination with emergency services. Review [BSEE Safety Alert 469 “BSEE Identifies Medical Evacuation and Emergency Hazards During Risk-Based Inspections.”](#)
- Train workers on gas accumulation hazards, safe operating procedures, and correct use of safety equipment.
- Establish contingency plans to ensure access to multiple transport options for rapid emergency medical care.
- Establish a process for reviewing incidents and near-misses to continuously identify lessons learned and improve safety practices.
- Ensure sufficient, current emergency medical supplies are available for immediate use.

– BSEE –

A **Safety Alert** is a tool used by BSEE to inform the offshore oil and gas industry of the circumstances surrounding a potential safety issue. It also contains recommendations that could assist avoiding potential incidents on the Outer Continental Shelf.

Category: Explosion, Fire, Personnel Safety