Bureau of Safety and Environmental Enforcement

SAFETY ALERT

Safety Alert No. 503

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Contact: bseepublicaffairs@bsee.gov

Phone: (800) 200-4853

Improper Gas Starter Installation Causes Flash Fires Resulting in Multiple Injuries

The Bureau of Safety and Environmental Enforcement (BSEE) investigated two incidents involving injuries to personnel caused by fires that occurred while attempting to start gas engines equipped with gas starters. The fires resulted from an accumulation of gas caused by improperly installed or disconnected exhaust vent piping on the gas starters.

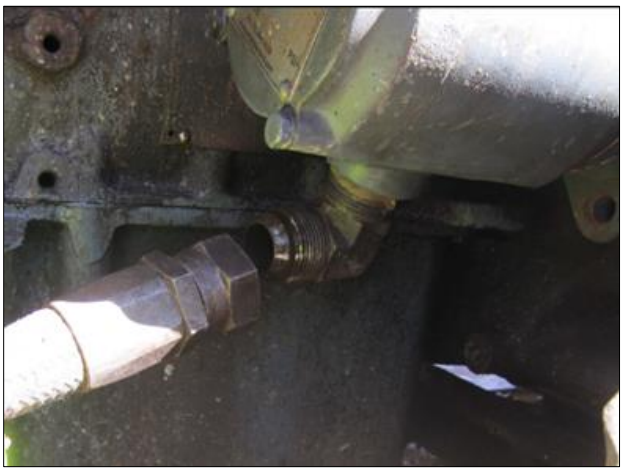

Figure 1: Gas starter vent line, shown post incident, was only partially connected. (Incident 1)

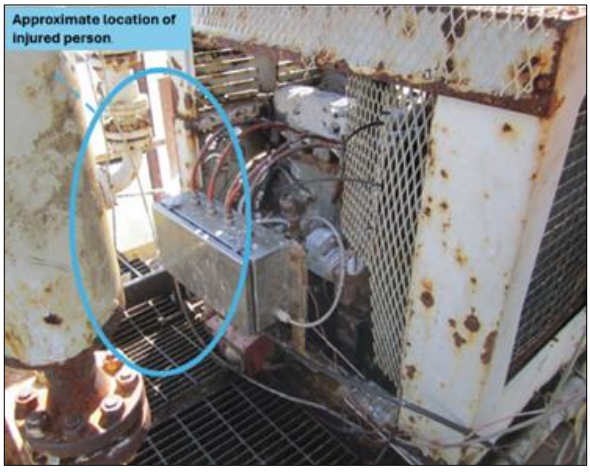

Figure 2: Position of an injured worker during time of incident. The worker was adjacent to the engine observing the magneto while another worker operated the start valve. (Incident 1)

Incident 1: An operator was attempting to start the gas engine of a pipeline pump while another worker operated the nearby manual starter valve. The starter exhaust vent line was not properly secured (Figure 1), resulting in gas accumulation in the pump skid and engine enclosure. During the start cycle, the engine backfired and ignited the accumulated gas, causing a flash fire that enveloped the workers (Figure 2). Both sustained burns to the hands, arms, and face. BSEE investigators discovered that the engine's air intake hose was disconnected, which may have allowed the gas-enriched atmosphere to be drawn into the carburetor and caused the backfire.

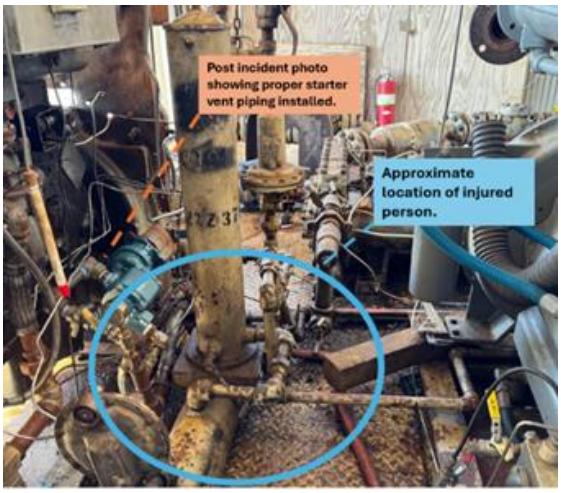

Figure 3: Location of injured worker during time of incident. (Incident 2)

Incident 2: The platform lead mechanic was troubleshooting the gas engine of a pipeline pump while another worker operated the control panel. While attempting to start the engine, the lead mechanic sprayed ether into the engine's carburetor. The exhaust vent piping for the starter had not been installed, which led to an accumulation of gas when the starter was actuated. During the attempt to start the engine, the combination of the gas-rich atmosphere and ether caused the engine to backfire and ignited the accumulated gas (Figure 3). The resulting flash fire enveloped the lead mechanic, and he sustained burns to his face, arms, and hands.

Therefore, BSEE recommends that operators and their contractors, where appropriate, do the following:

- When using fuel gas to start prime movers, ensure the starter exhaust gas is vented to a safe location.

- Implement and/or modify existing mechanical integrity awareness training for personnel to ensure checks of equipment before startup.

- Review gas engine startup procedures to include equipment checks verifying the proper installation of components.

- Utilize gas detectors when performing startup procedures on engines with gas as a fuel source and/or as a pneumatic supply for starters.

- Review engine maintenance logs, schedules, and procedures to see if previously observed mechanical issues have been addressed.

- Ensure proper maintenance procedures are followed to verify the proper installation of components.

- Conduct mandatory checks on engines with gas as a fuel source and/or as a pneumatic supply for starters to ensure proper installation of starter exhaust piping.

- Consider implementing a temporary fire watch when performing troubleshooting, startup, or post-maintenance operations on gas-fueled engines, particularly those using gas starters.

– 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: Injuries/Fires