Bureau of Safety and Environmental Enforcement

SAFETY ALERT

Safety Alert No. 509

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Miscommunication and Trapped Pressure Causes Injury During Valve Maintenance

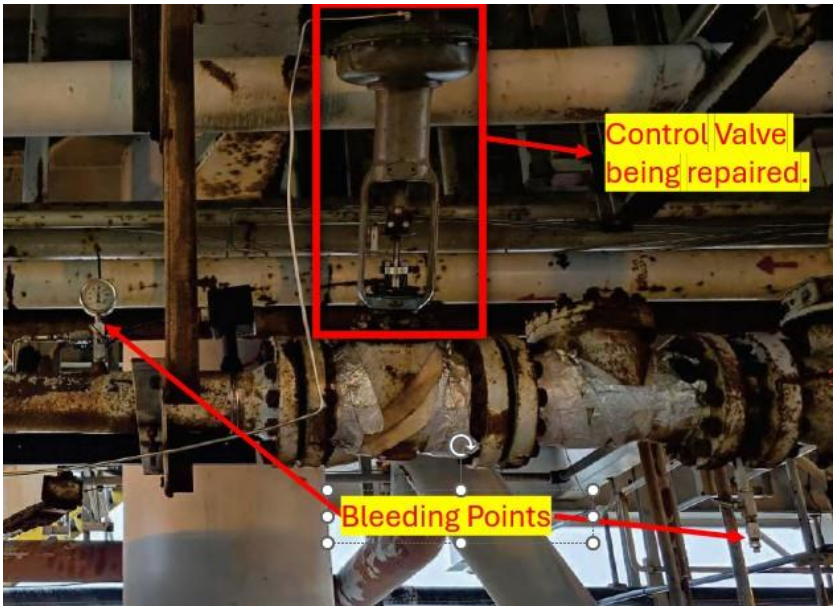

Figure 1: Trapped Pressure on Control Valve being repaired.

Background:

A contract worker was injured and evacuated after a gas release incident on an offshore facility in the Gulf of America. The incident occurred while a contract employee was performing maintenance on an E-body control valve on a six-inch gas line. BSEE's investigation found that residual pressure estimated at 128 psi inside the six-inch gas line was released during disassembly and replacement of the valve's trim and seat. The sudden release caused the valve's bonnet flange, weighing approximately 50 pounds, to be forcefully ejected. The flange struck the worker in the chest and abdomen, knocking the worker backward onto the elevated scaffold platform. The worker was evacuated for treatment and evaluation. Injuries included bruising and abrasions to the left abdomen wall and chest, a laceration behind the left ear, and abrasions to the left knee.

Incident Findings:

- **Incomplete job safety analysis (JSA):** The JSA was not reviewed or signed by the platform's person in charge (PIC), as per policy.

- **Inexperience and procedural gaps:** The worker had less than two years of field experience under mentorship and was unfamiliar with key procedural requirements, including verifying the gas line's condition through proper isolation checks and ensuring all necessary approvals and safety documentation were complete before starting work.

- **Miscommunication:** The worker began work without PIC approval and without notifying the PIC. Additionally, the worker had not assigned an operator familiar with the production process to assist. There was no clear discussion of the scope of work or hazards. The worker assumed the gas line and control valve were fully depressurized, based on comments made earlier that morning.

- **Unauthorized use of scaffolding:** The worker used a scaffold tagged "do not use" due to a missing ladder and kick plates. The worker was also working more than six feet above the main deck without fall protection such as a full-body harness and retractable lifeline.

- **Failure to verify zero energy state:** An energy isolation permit, required to confirm the gas line was fully depressurized, was not completed. The worker began the task without verifying the line was free of trapped pressure.

- **Failure to follow procedures:** Original equipment manufacturer (OEM) guidance requires at least four nuts should be left on the studs and partially backed off during bonnet flange maintenance and disassembly. This precaution prevents the flange from being forced upward if trapped pressure is present. In this case, the worker did not keep the safety nuts on the studs.

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

- Regularly review incidents and share learnings with all relevant personnel to raise awareness of hazards and contributing factors.

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- Ensure that all JSAs are collaboratively developed and discussed to identify and mitigate possible hazards associated with the task and have proper documentation and authorization before work begins.

- Ensure clear communication between PIC, the operators, and all third-party contract workers.

- Third-party service personnel working on pressurized systems or valves should be accompanied by a qualified operations member to verify safety measures are acknowledged and completed prior to work commencement.

- Implement additional safety barriers, such as caution tape, around unsafe scaffolding until it is approved for use by a competent and authorized person. Adhere to fall protection requirements above six feet.

- Always confirm zero energy state using double-block and bleed or equivalent methods before disassembling pressurized equipment.

- Adhere to OEM procedures for valve maintenance, disassembly, and reassembly.

- Close energy isolation permits daily and validate before resuming work.

– 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.

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