IN-011 | Sour Gas Release from a Pig Barrel

What was the Problem:

The seal on the pig barrel failed due to improper alignment.

What Happened:

While attempting to pressure up a pig barrel to send a pig, a seal failed on the pig barrel door, resulting in loss of primary containment (LOPC) of sour gas. The seal was replaced and a second attempt was made to send the pig, resulting in a second seal failure and LOPC of sour gas.

What was the Impact:

Release of sour gas (6,000 ppm) at high pressure (11,000 kPa) to the atmosphere, with two workers in close proximity.

Incident Learnings:

Equipment difficulty related to the design and operation of pig barrel door closures. Inadequate procedures by the manufacturer and operator, ineffective training, along with difficulty in conducting a door alignment (2 mm of tolerance), all contributed to the release.

Hazards and controls were also not adequately assessed for pigging with this type of pig barrel closure. Improper alignment and seal failures were a known risk based on learnings from previous events and warnings in the manufacturer's procedures. The risks were not fully understood and the task was normalized; therefore, additional controls were not implemented to address the hazard.

The response to the second event also put the workers at risk, as the hazards were not fully understood or evaluated and additional controls were not considered or implemented.

Photo: Site during release (cloud of sour gas)

Corrective Actions:

- Developed and rolled out training on closure door alignment.
- Inspected all closures in the field to verify and adjust alignment.
- Implemented interim procedures for pigging with this type of door closure until they are replaced with a different style, which includes:
  - Use of SCBA when pigging.
  - Using non-sour product to pressure up pig barrel to line pressure prior to sending.
- Added guidance in the Engineering standard to ensure the risks of a failure at any pressure, due to improper door alignment, are evaluated prior to selecting this type of closure for new installations.

General Learning:

Response to events matter—take the time to fully evaluate the hazards and risks associated with an event prior to responding. Ask yourself: Do we need to enact our ERP? Freeze the scene? Do we need a Task Risk Assessment? Have all hazards been evaluated and mitigated? Are we missing anything?