Step Change Safety Alert Template

Alert Title

Crude oil spill from filter housing on a crude oil export line.

Incident Date

12th October 2012

Location Type

Floating, Production, Storage and offloading

Specific Equipment Involved

The spill originated from a filter on a cargo (crude oil) export line located upstream of the export metering skid. The filter is comprised of a main housing, door and filter basket. The housing door is sealed using a bandlock closure mark 1 with an energised seal.

Description of What Happened

During tanker offloading operations, a crew member found a spill of crude oil coming from the export metering skid and immediately contacted the CCR. The offloading operation was stopped and initial inspection showed that a substantial amount of oil had been spilled to deck from one of the export metering streams.
Initially due to hours of darkness, it was virtually impossible to determine how much oil had been lost to sea. Following further investigation it was determined that approximately 110 bbls were captured in containment on deck and approximately 2 litres lost to sea (Calculated using the Bonn Agreement Methodology).

Cause of Incident

1. **Design- failure related to design**

The Bandlock closure mark 1 uses energised seals to create a seal on the filter housing door. This requires application of fluid pressure on the seal in order to push the seal out against the seal face. In the event that there is no pressure applied to the seal, it will relax back to its normal profile. In this condition and in the event there is a backwash (i.e. when pumps are shutdown quickly as occurred in this situation) , this can result in debris being washed up into the bandlock seal area. With debris in contact with the seal or seal face, the seal can be compromised resulting in leak path. Following system shutdown and spill containment, the filter housing was opened for inspection of the seal. Pieces of plastic, polythene and perspex material were found between the seal and seal face.

2. **Equipment- No failure in the equipment itself**

Operation –ESDV trip and immediate shutdown of the cargo discharge pumps allowed fall in pressure within the line and the resulting backwash flushed debris into the relaxed seals.

3. **Procedural – Deficient procedure**

Standard Operating Procedure did not require standby person for restart after shutdown as it was assumed that the pre discharge pressure testing and uneventful discharge demonstrated export line integrity. The effects of shutdown on the integrity of the seals were not known.

4. **Operational mode in area at time of release** - **Cargo discharge**

Incident Consequences

Approximately 110 bbls was lost to deck (contained) and approximately 2 litres lost to sea calculated using the Bonn Agreement Methodology.

Lessons Learned/ Recommendations

- Review the adequacy of bandlock closure for use on the filter enclosure and identify alternative closure devices.
- Review the design of the filter arrangement to avoid debris getting to the sealing area with the installation of a screen between the filter and the seals.
- Provide CCTV coverage to allow monitoring of the metering skid during offloading operations.
- Review and update Standard Operating Procedure to ensure that clear guidance is provided for startup, shutdown and on actions to be taken following a trip of export operations including requirement to have standby person at metering skid.