Description of incident: Oil leak 2014

More than 10 years ago, three level indicators and two pumps in an oily water tank were removed as there were failures on the pumps and problems with the instrumentation. It was evaluated that a pressure regulator was sufficient to regulate the level in the tank.

Two simultaneous operations were ongoing in the loading system for stabilised oil at the same time. These were;

- Drainage of stabilised oil between two shut-in valves for the pipe segment to a loading pump
- Transfer of oil from the platform

An internal leakage in the partitioningvalve between the transferring and preparation locations was not known, and there was not established a preventive maintenance program for shut-in valves in the loading system. During drainage of stabilised oil, the oil was poured to the sump tank in the equipment shaft and was pumped three times to the oily water tank and further through the liquid locks to sea. The oily water tank was not drained down to the mud cell as assumed in the design. Approximately 10 m^3 of stabilised oil was poured through the overflow of the liquid lock to sea, while approximately 2 m^3 was spilled on the platform. The total rate was 20,8 kg/s.

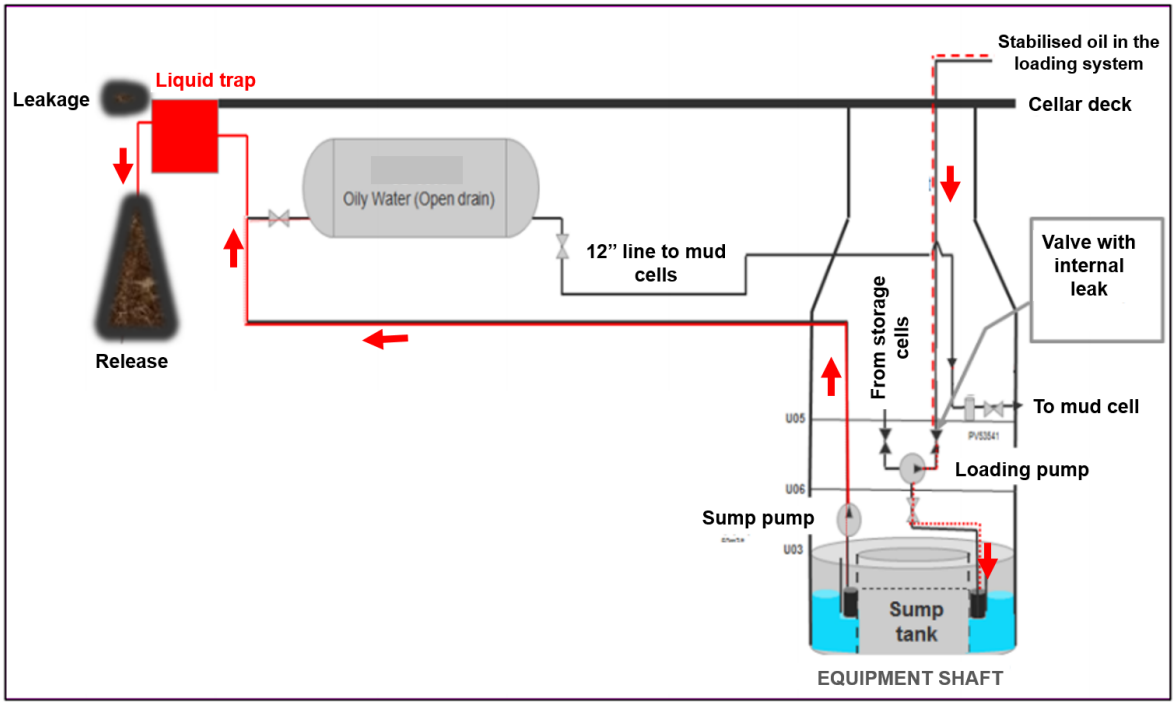

Figure: Visual description of the incident (the red line indicates the oil flow when the leak occurred).

Causes

Direct cause:

Drainage of a larger pipe segment than planned for to the sump tank.

Root causes:

- Not adequate monitoring of the pipe segment.
- Simultaneous operations not adequately evaluated.
- Internal leak in the partitioningvalve between transferring and preparation locations was not known.

- Preventive maintenance program for shut-in valves in the loading system was not established.
- Liquid in the oily water tank and return line to the mud cell was replaced by stabilised oil.
- Lack of design and system understanding with regards to modifications and systems that affects the oily water tank.
- No alarm due to high level in the oily water tank.
- Level indicators in the oily water tank were removed, it was evaluated that pressure regulator was sufficient for level regulation.

Learning points and recommendations:

- Ensure that leak test of shut-in valves is executed and that the drainage is being monitored.
- Consider to include requirements regarding limitations and/or compensating measures during simultaneous operations in the loading system.
- Review of design criteria for open drain system and evaluate these against different operational conditions for the oily water tank.
- Review of responsibilities and routines for maintenance of liquid traps.