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Agência Nacional
do Petróleo,
Gás Natural e Biocombustíveis

Safety Alert 015 - ANP/SSM

Loss of tightness from flexible service riser during diesel inertization procedure

This Operational Safety and Environment Superintendence is issuing this safety alert to notify the petroleum and gas industry and other stakeholders about Loss of tightness from flexible service riser during diesel inertization procedure.

What happened?

During a diesel circulation for inerting the well-platform circuit, after a production shutdown, the service line that connects the annular of the well to the production unit lost its tightness, causing diesel spill for the sea.

The loss of tightness in the service line was due to the reduction of the internal pressure below the minimum limit established for the riser operation, together with a pre-existence of ovalisation located in the lower riser section near to TDP (Touch Down Point). This pressure reduction occurred at the WCT (Wet Christmas Tree) valve opening for communication between the service line and the production line to permit diesel circulation. The diesel migration flowrate from service line to production line was greater than the diesel pump flowrate from topside to the service line, causing a flow intersection in the service line. With the pressure reduction below the minimum level in the region of the riser ovalisation, the flexible riser layer responsible for supporting the external pressure did not tolerate the differential pressure, causing the riser to collapse. The riser collapse caused a damage in polymeric pressure barrier, which is the layer responsible for tightness.

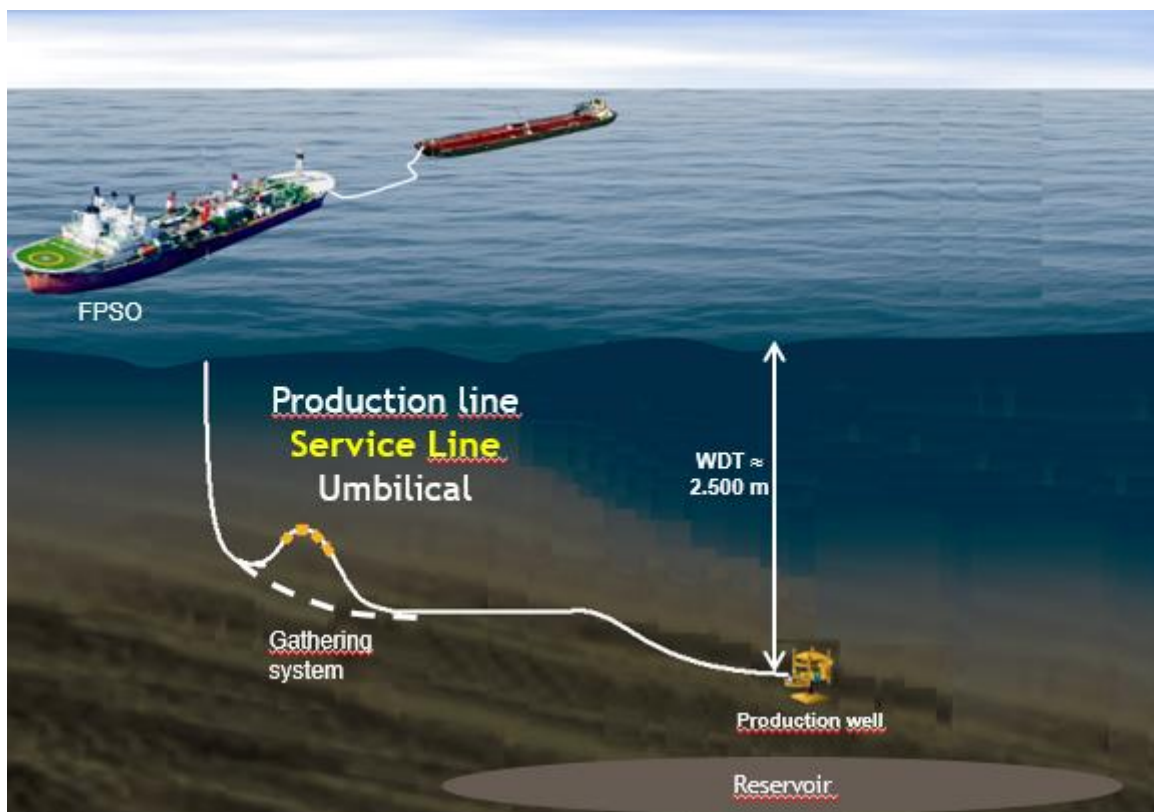


Figure 1 – Production System Sketch

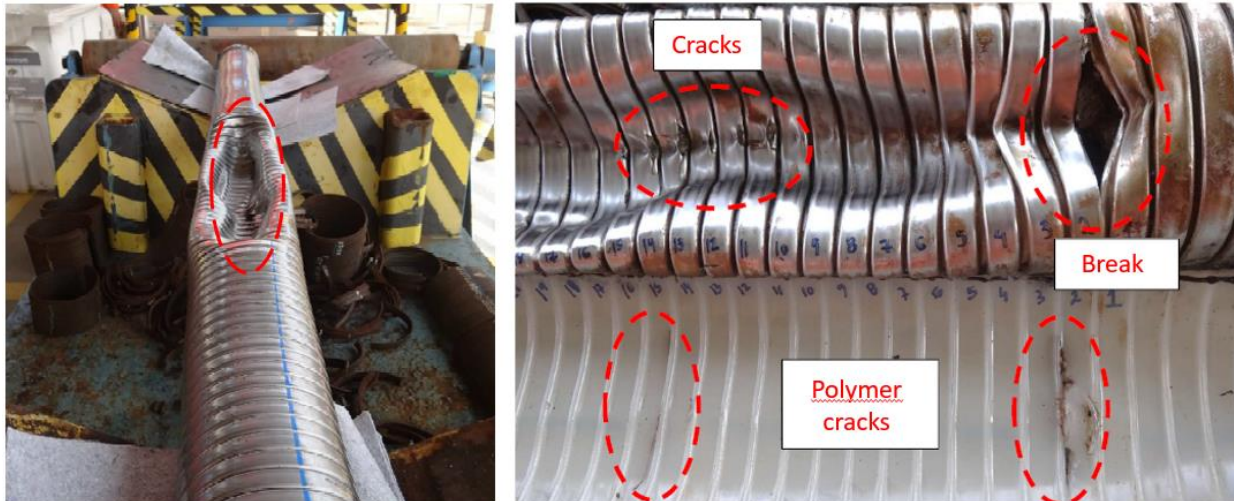


Figure 2 – Pictures of the flexible pipe after dissection (collapsed carcass and pressure barrier damaged)

Potential consequences

The service line loss of tightness caused a spill of diesel in the sea, being an accident with environmental consequences.

Identified causes

- Failure in Preliminary Hazard Analysis (PHA);
- Failure in Management of Change (MOC)

The root causes pointed out in the Operator's investigation were: (i) the failure in PHA, which did not identify safeguards and / or detections for the event occurrence. Decrease in the liquid level was a condition that would lead to a risk for a flexible pipeline with an ovalisation damage; and (ii) the failure in the charter MOC, which did not identify as critical the signals given by the anomalous behavior of the service riser. Diesel was drained to the platform after the previous circulation that led to a riser safe operation envelope violation.

Lessons learned

- Carry out technical evaluations of the flow conditions, either on a permanent or transient periods, after identifying a deviation in the reused flexible pipeline. It will aim to confirm that the operational parameters will not exceed the limits established in the updated pipeline safety envelope;
- Establish a clear rule to identify an operational procedure as critical. This will require a specific procedure PHA, before its execution, with the HSE specialists participation.
- Critically evaluate the operational changes management actions in case of platform operated by a third party (charter platform).

Regulatory Framework

According to item 16.2.2 of ANP Resolution no. 41/2015, the operator must identify the necessary actions for risk mitigation and prevention. This must be done in a systematic way and with the management of changes in the Operational Envelope of the production system.

According to item 16.2. of ANP Resolution no. 43/2007, Changes in operations, procedures, standards, facilities or personnel must be assessed and managed so that the risks arising from these changes

remain at acceptable levels. In this way, all possibilities for reducing risk levels must be raised and recorded even if the assessed risks are at "Moderate" level.

Contact

For additional information regarding this safety alert, please contact ANP's Operational Safety and Environment Superintendence at incidentes@anp.gov.br.