LFI: Pinhole Leak on Landed Condensate Line

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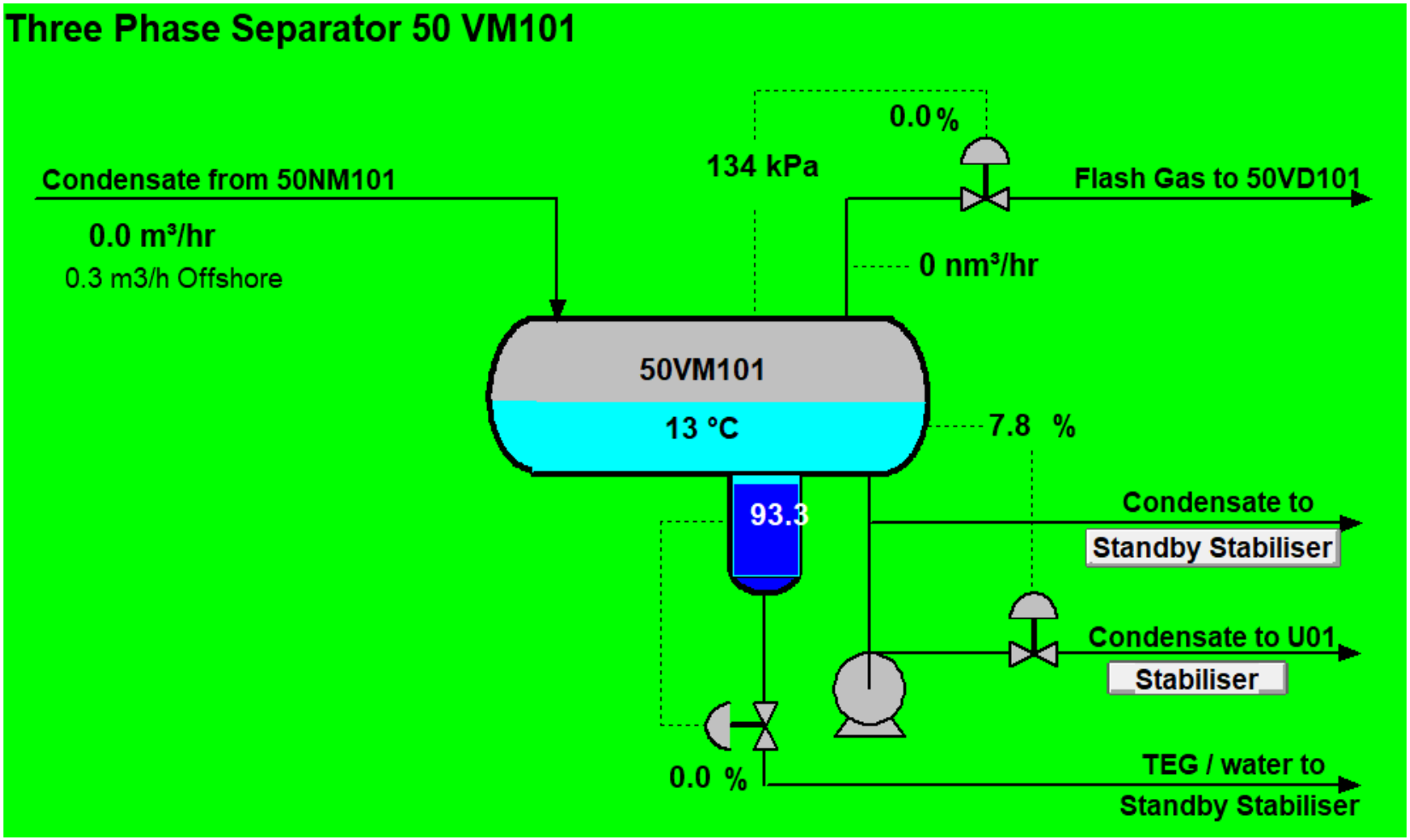
PetroSA LFI: Pinhole Leak on Landed Condensate Line

1. What happened?

- On the 17/08/21 at 10h30, a pinhole leak presented on the landed condensate line at the Air and Gas Separation area - upstream of the dune valve on the offshore side before entering the unit.
- *The leak was initially detected by the fixed gas detector 99NE99011 that sent a gas alarm signal to the DCS and to the SCADA systems at the Shift Managers office and the Security Control Room.*
- The leak was of a splashing nature, observed to have been water and also intermittently hydrocarbons.
- *The hydrocarbon/water mixture spilled on the concrete deck with minimal ground contamination. Immediate action taken was to shut down the condensate export from Offshore. The leak was contained by installing a temporary clamp.*

What happened?



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1a. Incident Investigation Observations

50_NE1076 alarm tends to activate often / 50VM101 design water rate / Platform sending produced water to GTL.

- *The Platform is currently routing all its produced water to the GTL. The Overboard oil in water analysers malfunctioned. The system is designed to receive water with a draining rate from VM101 of 16.5m3/h. The water from offshore is averaging 2.5m3/h the past few months and 5.5m3/h during 1X1 operation (2020). This is within the design.*
- The problem at VM101 is the water overflows the drain and goes to deck. Fumes/condensate then trigger the gas detector. The problem is not 50VM101 or the boot, but the flow regime in the condensate line. At times we get water slugs, and other times we get condensate slugs. This disrupts the residence time required to properly separate oil and water, causing water exiting boot to contain hydrocarbons

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1b. Incident Investigation Observations

Normalization of risk - personnel being desensitised to alarms when they activate.

- *Unintentional error: SPC did not open the alarm page to verify its tag number.*
- Misinformation to Shift Manager on nightshift 16.08.21 at 22h11.
- *The shift handover log on the 16/08/21 (Night shift): incorrect information was inserted*.
- The SCADA system at Fire Department was not functioning correctly.
- *Miscommunication between Security department and fire department.*
- Lack of Shift handover between the Night shift DCS panel operator on the 16/08/21 and the dayshift panel operator on the 17/08/21.
- *Miscommunication between DCS panel operator and the Shift supervisor on the exact alarm tag number.*

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1c. Incident Investigation Observation

Lack of required communication: informing the Fire department upon discovery of the leak.

- *Preventative Maintenance plans are not up to date.*
- Lack of available crowcons in the area.
- *Training material needs to be updated.*
- The syngas area has reduced staff to safety critical levels due to Covid reasons.
- *One of the DCS panel operators had not yet been certified to be competent*.
- Low Morale due to the current company status.
- *Findings from inspection: It is suspected to be a combination of external corrosion and original manufacturing defect that caused the Pinhole.*

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2. Why did it happen?...Sub-standard Behaviours

Immediate Causes: as determined using RCAT methodology.

Sub-standard Behaviors/ At Risk Behaviors

- *Procedure not followed- The gas alarm 99_NE99011 was not investigated when it activated. On the Unit emergency operating procedure AGS/PR/001/007 there is details on how to respond in an event of a fire or gas leak.*

Sub-standard Conditions / At Risk Conditions

- Inadequate equipment for the purpose. TJR required to review draining from 50VM101 boot to nearby drain instead of deck (review line size).

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2. Why did it happen?...Sub-standard Behaviours

ROOT CAUSES: as determined using RCAT methodology

Human Factors:

- *1. Behavior- Habit*

Workplace Factors:

- Engineering- Inadequate technical design/Inadequate standards, specifications and design criteria
- Knowledge/competency management- Inadequate revision or update of training material

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3. What were the Learnings

PSF: We sustain barriers- Human barrier failed:

All alarms must be investigated; it should not be assumed that it's a non-action alarm. It should be verified and if a faulty alarm is suspected, a job notification should be loaded for the analyzer department to come and service the detector.

PSF: We sustain barriers- Hardware barrier failed:

A TJR (Technical Job Request) to review the drain line size from VMV01 boot to a nearby drain line to Offsites & Utilities when the operational change was implemented, was not done.

Recommendations for Improvement

	Action	Responsible Task Owner	Due Date
1	Initiate a TJR to review the draining from 50VM101 boot to nearby drain instead of deck (review line size).	AGS process engineer	30/09/2021
2	Update the area production training material and conduct training for all area production personnel.	Air and gas separation superintendent	30/09/21
3	Conduct refresher training as per procedure FIR/WI/GTL/017 “Emergency alarm system” for all GTL refinery areas.	Fire Department trainer	30/10/21
4	Issue an instruction to all AGS Shift supervisors to reiterate the company policies and procedures regarding the training and competency requirements for DCS panel operators.	Area Manager AGS	17/09/21
5	Investigate the impact of a lack of an area shift supervisor during night shift.	Area Manager AGS	17/09/21

Recommendations for improvement

	Action	Responsible Task Owner	Due Date
6	Initiate and implement a maintenance strategy at Units 50/99 on piping exposed to External corrosion	Area Mechanical Engineer AGS	30/10/21
7	Perform a risk assessment on gas detector equipment & maintenance and update the department risk register to reflect the risk of inability to perform preventative maintenance on unit gas detectors across all the GTL refinery areas	Control systems engineer	15/10/21
8	Initiate a formal change management process to risk assess the impact on the supervisor alarm information due to unavailability of the B-PLC SCADA system path.	Control systems engineer	15/10/21
9	Initiate a SORA (Safety override risk assessment) for the preserved units. To assist with ensuring that the alarms from offline units do not flood the DCS panel.	Area Process Engineer	30/09/21

Thank You….

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