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The Petroleum Oil and Gas Corporation
of South Africa (SOC) Ltd

PSM

“Condensate Spill @ Voorbaai Tank Farm”

Process Safety Incident





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Voorbaai Tank Farm



- Product transfer through SBM to ships destined for PLZ and EL markets.
- Receipts of condensate (equivalent to light crude, but associated with gas reservoir) feedstock.
- Main tank farm at GTL Refinery 15km west. Pigging of transfer lines necessary for bi-directional movement of products and feedstock.



Background

Oily water transfer to the GTL refinery for cleanup is also done through the condensate transfer pipeline as is diesel. Water transfer was completed and condensate feedstock transfer became necessary. The schematic is below.

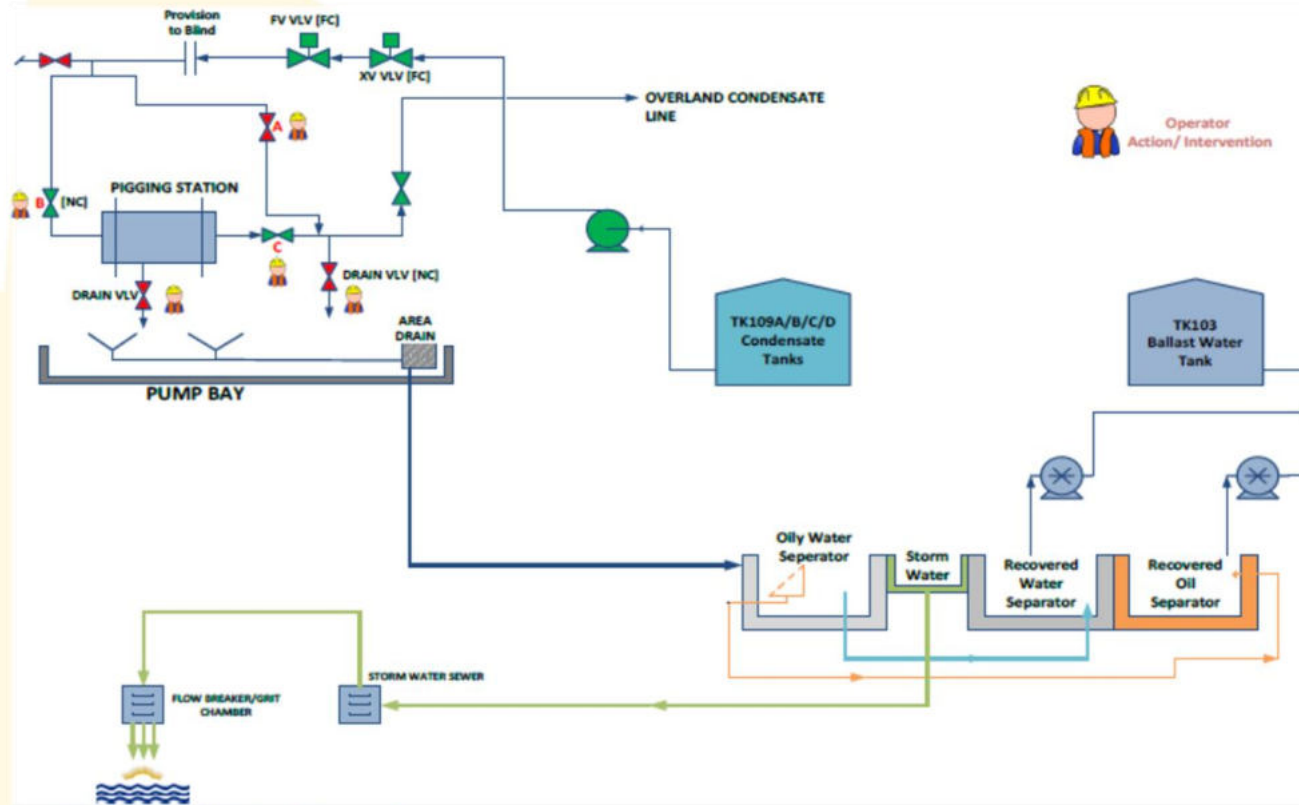
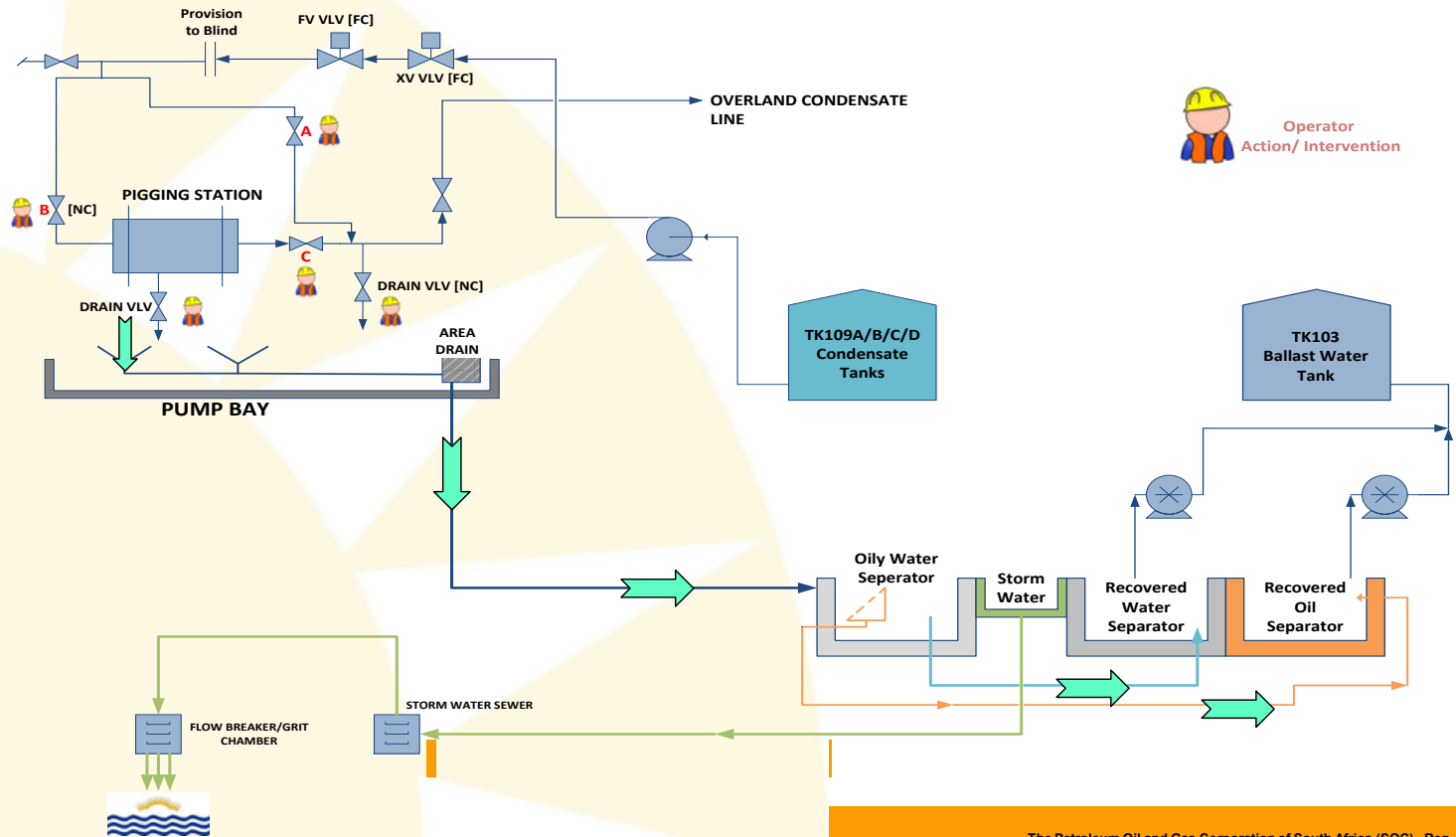


Figure 2: Schematic of Pigging Station and Sumps



Sequence of Events

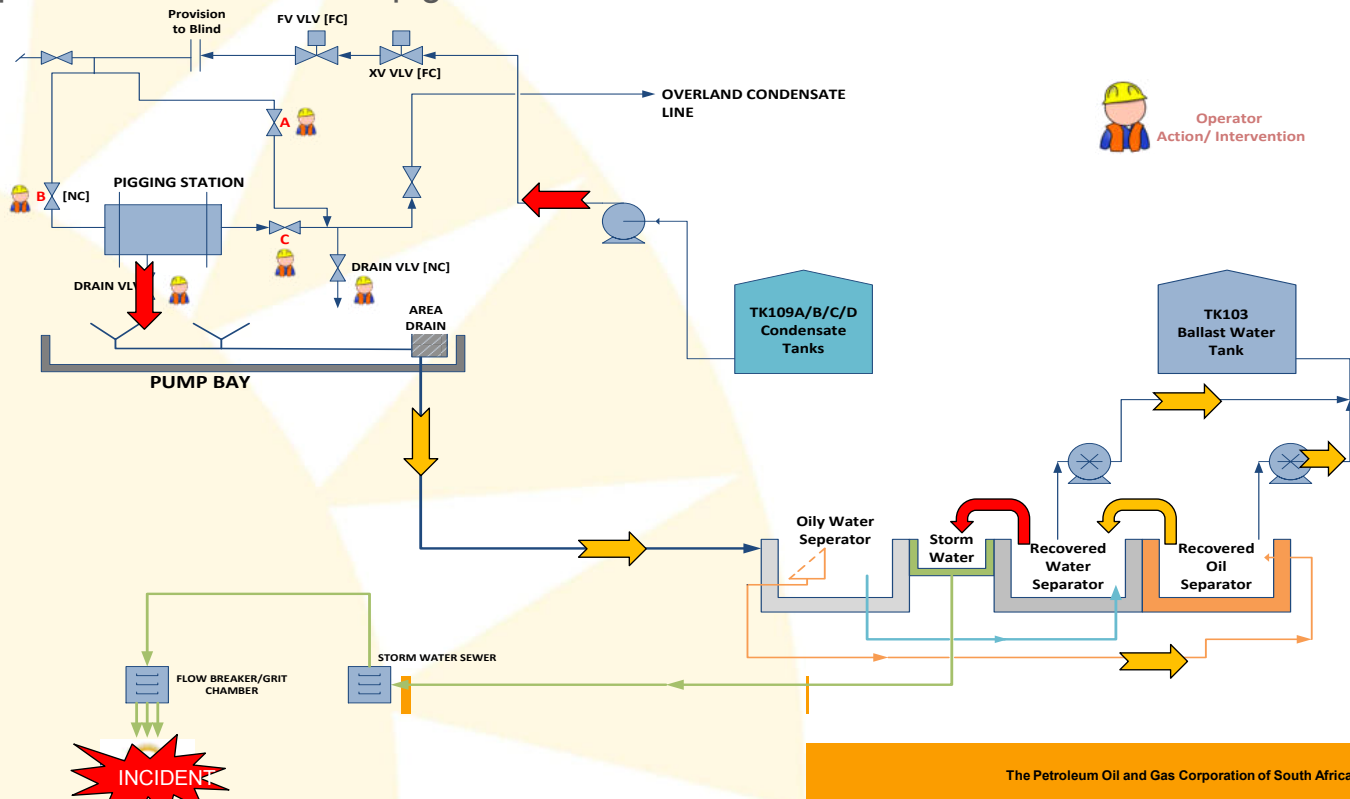
- Instruction from panel operator to outside operator to drain pig launcher of water in order to pig the line for condensate transfer to GTL Refinery. Pig launcher drained.
- Pig to use not available at Voorbaai – it was stuck in transfer line at GTL Refinery.
- Blocked in pig launcher at Voorbaai, transferred 50m³ condensate in an attempt to unstuck pig.





Sequence of Events...

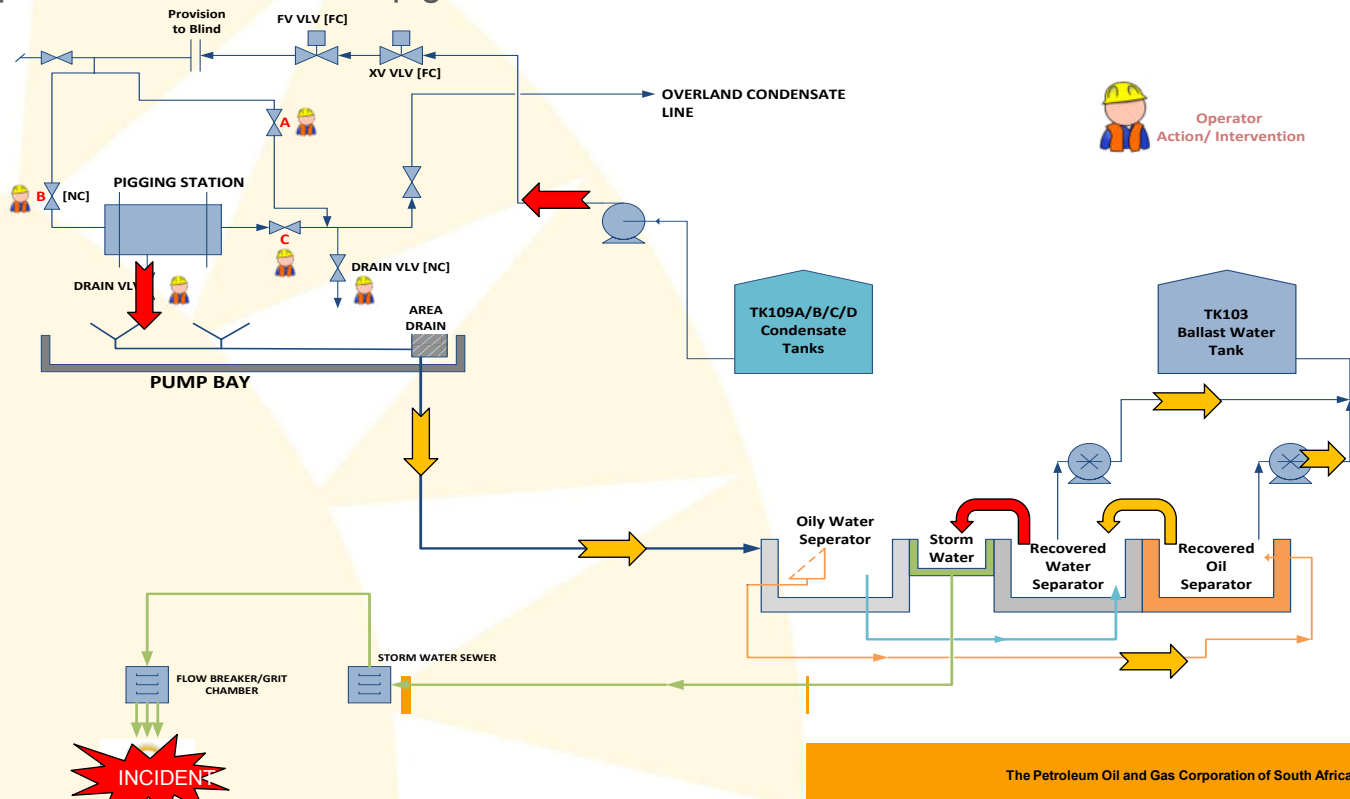
- Transferred 50m³ condensate and pumps stopped.
- Panel operator instructed outside operator to drain pig launcher again. Drain valves left open and outside operator left pig launcher station.
- 1 hour elapsed – GTL Refinery said that pig was still stuck and asked that an additional condensate be transferred. Panel operator then started transfer pumps upon block in discharge and open drain valves on the pig launcher.





Sequence of Events...

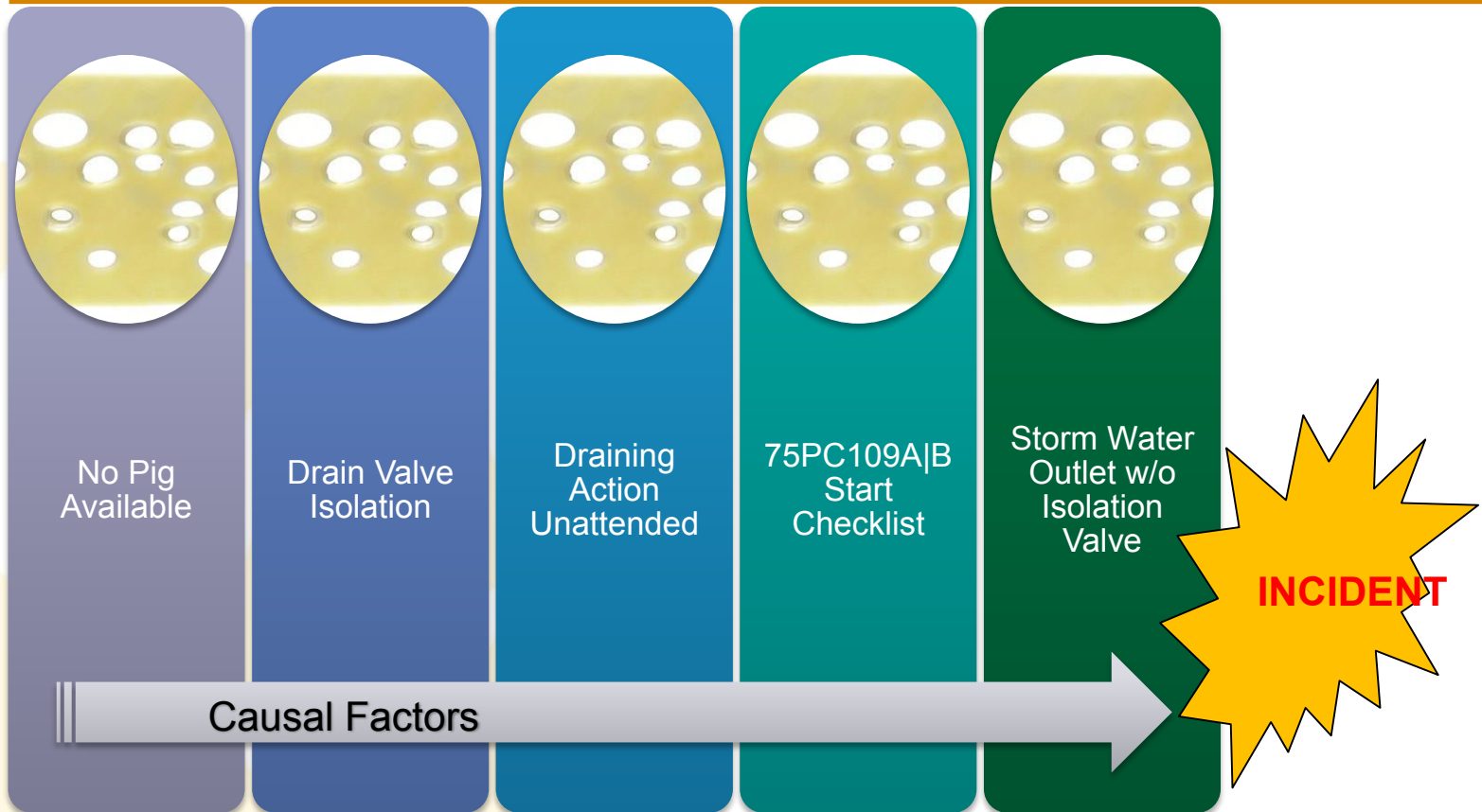
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Swiss Cheese Barrier Failure

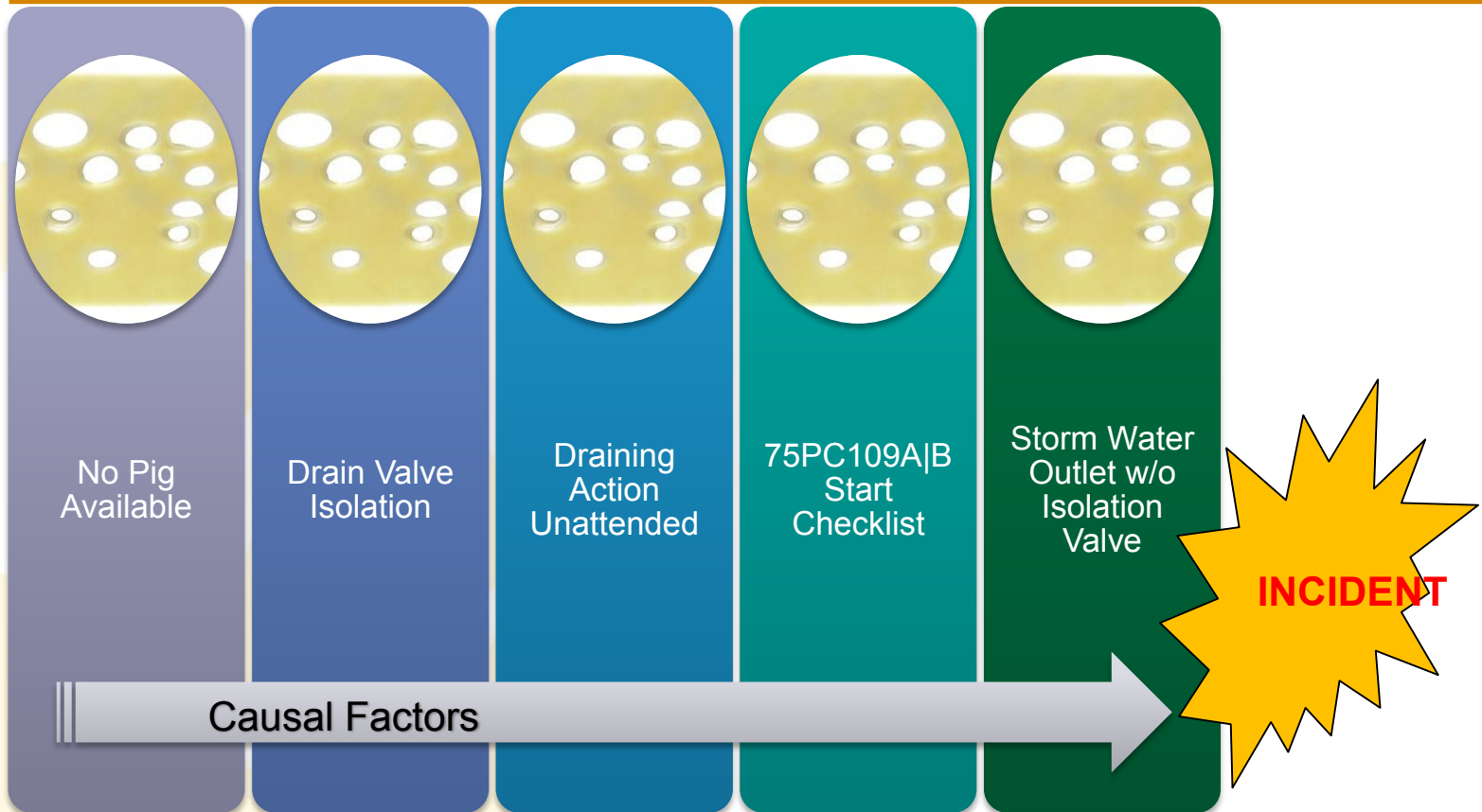


- A pig was not available at the launching area prior to preparation of the pig launching activity, the only pig available was stuck in the pig receiving chamber at GTL Refinery Tank Farm.
- The isolation of the valves for draining the pig launcher was not followed according to pigging procedure. Pump side isolation of the pig launcher not done.



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Swiss Cheese Barrier Failure



- The draining of the pig launcher was left unattended.
- Condensate transfer pumps were started without completing the checklist and confirming with outside operator that it was safe to do so.
- The stormwater outflow pipe connected to the oily water separator does not have an isolation valve.



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Condensate Spill Itself...(approx. 20m³)



Photograph 1: Condensate spill at beach



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| Voorbaai Spill....in the News.

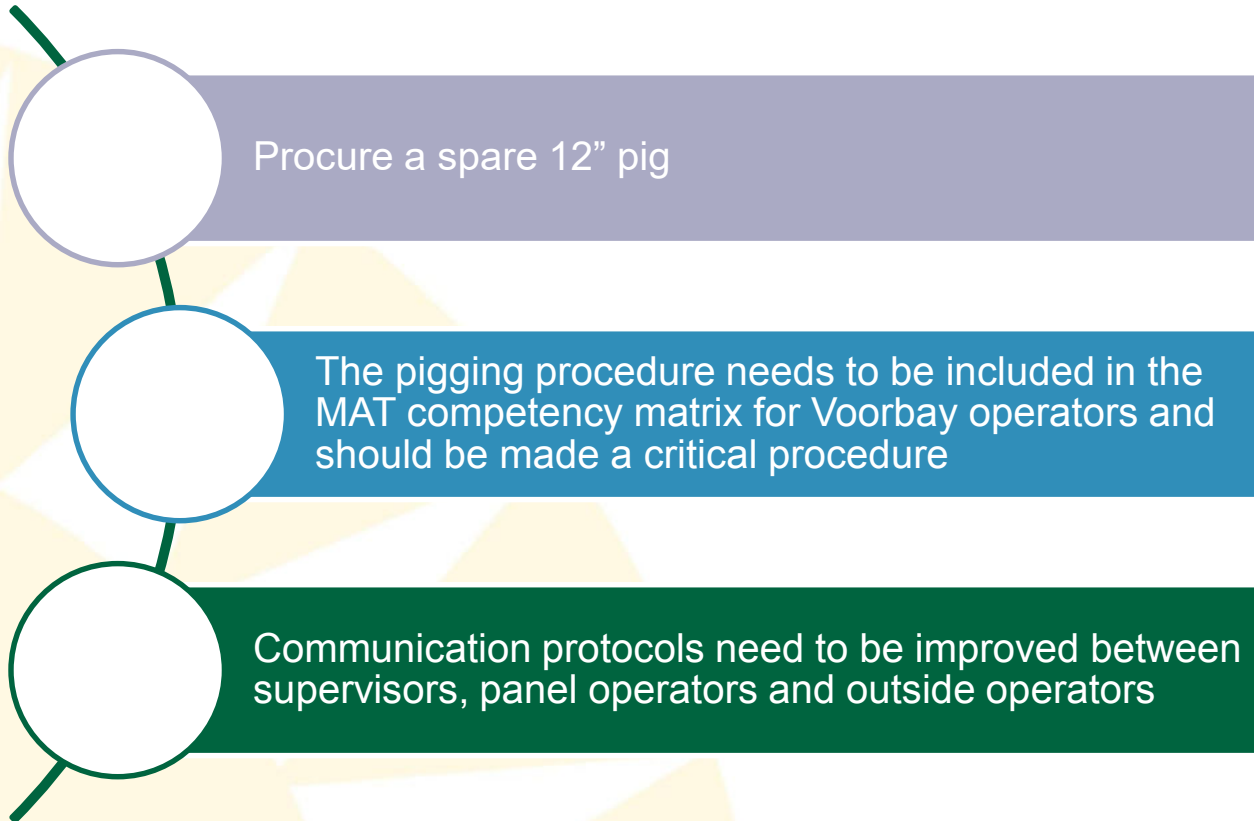


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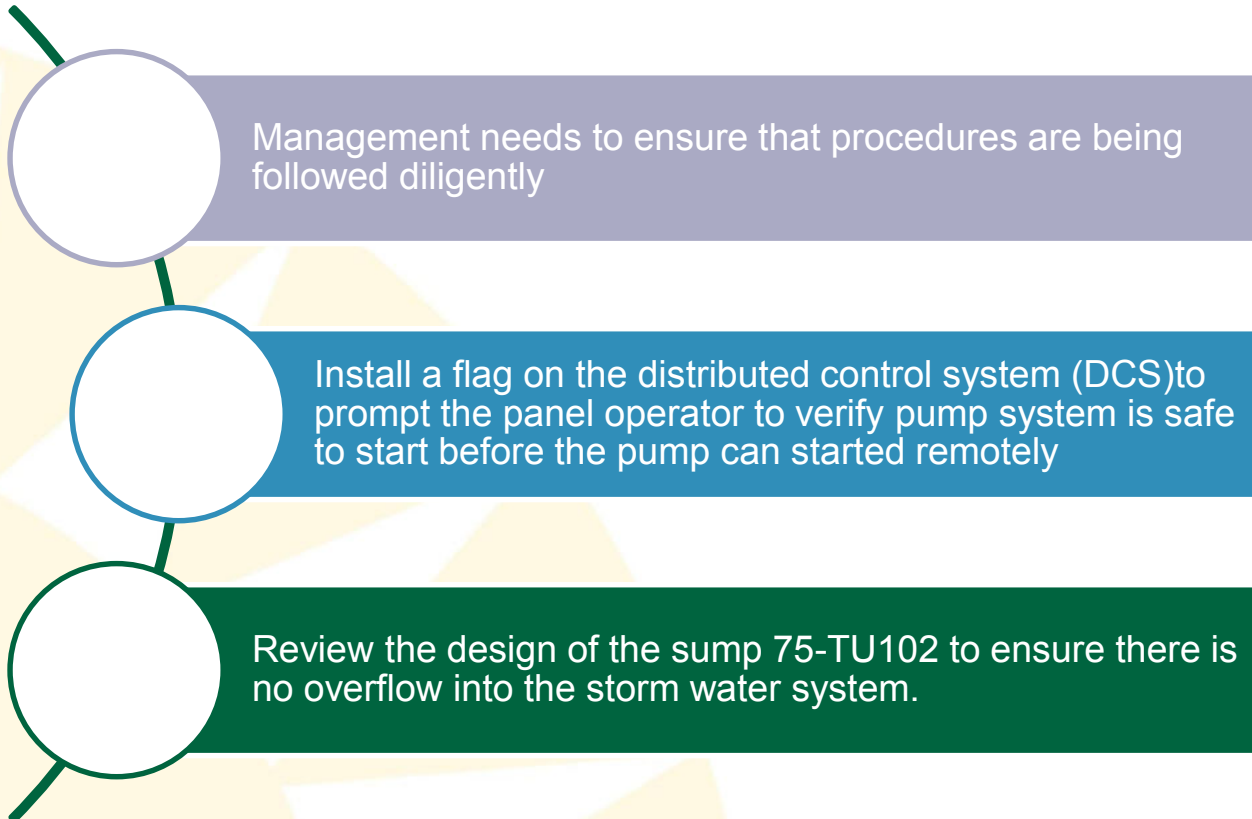
Corrective Actions





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Corrective Actions...





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Corrective Actions...

The procedure needs to be updated to include all relevant steps in the preparation of the pig launching system which should include the following

- *Pig to be available at launching area before preparation of the system*
- *Continuous monitoring of the draining of the pig launcher*



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Thank You...

