



RIM SEAL FIRE F40115



Proudly Natref

Date of incident: 1/12/2018

Time: 16h15

Tank involve: F40115

Product: Crude oil

Tank size: 54.8 m

Tank level: 1.670 m





SEQUENCE OF EVENTS



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16h10: The outside operators were doing routine inspection at the pump station and fire pump house area

16h15. The operators heard a loud bang. The fire rim seal fire alarm sounded at tank F40115

16h16. The field operator was instructed to investigate and confirmed that smoke was emerging from the tank

16h17. Panel operator commence with call out procedure

16h17. Instructed outside operator to deploy rim seal trailer and for the 2nd operator to start the fire pumps

16h18. Operator drove rim seal trailer to center road at F40115 and coupled trailer to the rim seal pourer inlet

16h20. 2nd operator arrived at the fire pumps and started the pumps manually.



SEQUENCE OF EVENTS



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16h24. Rim seal trailer activated foam attack started

16h26. Cooling rings activated on tank

16h28. Operator reported that the fire has been extinguished

16h32. Incident commander from NDO arrived on site and established the FCP

16h37. EThekwini fire department arrived on site.

16h40. Operator confirm that foam attack duration 20 -25 min.

16h40. Stop the foam attack and continued with cooling only.

16h40. Dispatched crew to tank F40115 with the NDO quick attack vehicles as back-up

16h55. Monitor tank shell temperature and confirmed 37°C

17h12. Apply another foam attack and allowed fire department to investigate using SCBA's



SEQUENCE OF EVENTS



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17h15. Confirmation of fire department – no fire

17h15. Continued with cooling

17h20. All staff and fire department withdrawn due to bad lighting

17h30. Cooling on tank stopped and monitoring done.

19h00. Refilled the rim seal fire alarm and quick response vehicle

20h00. All clear given by IC

20h05. Fire department left site

20h05. Monitoring continued





Immediate corrective actions taken



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Emergency protocol was initiated

Fire was extinguished by the onsite operators

Tank was isolated

Back-up equipment was immediately available

Tank was monitored to ensure that re-ignition does not occur.





Facts gained from the incident



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There was a heavy lightning storm in the Durban area.

Tank F40115 level was 1.670 m (minimum operating level at 1,4 m).

Lightning struck the tank (northerly direction).

The seals were damaged at two different places.

The quick response by the operator prevented extreme damage to the tank and seal area





Actions put in to place



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NDO and local fire department to continue with monitoring until all clear by IC

Suction/discharge and MV to be locked out

Do not isolate the Enraf for monitoring purposes

Refill rim seal trailer immediately whilst keeping the quick attack on stand-by

Refill the quick attack

Monitor water on roof and drain to the process sewer if required

No COP (out off) or SBM (into) tank F40115

Restart COP after all clear has been done





What, how and why



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Why was there a fire on the tank?

Crude oil gas ignited in the rim seal area

Why did gas ignite in the rim seal area?

Friction and static was ruled out

Direct lightning strike to the tank

Why was there gas in the rim seal area?

Crude oil vapor sometimes escape through the tank seals. The seal does not always form a tight seal with the tank shell.

Why did the mixture ignite?

The lightning strike resulted in a hot spot that ignites the gas vapor.

Why did the hot spot occur?

Direct lightning strike



What, how and why



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Was there any leaks find on the fire area during the LDAR survey?

No leaks found during the survey. (Wind still day with no water on the roof)

Why was there then a gas vapour in the seal area?

During rain (water on one side of the roof)and windy conditions the roof moves. It could result in that the seal moved slightly away from the tank shell and released a gas vapour.



Fact to consider:



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Whether conditions

It was raining and windy.

Was the tank earth checked?

Yes, no defects found

Did the removal of the fence area contributed to the fires on two tanks in the last 3 years?

Still needs to be proven





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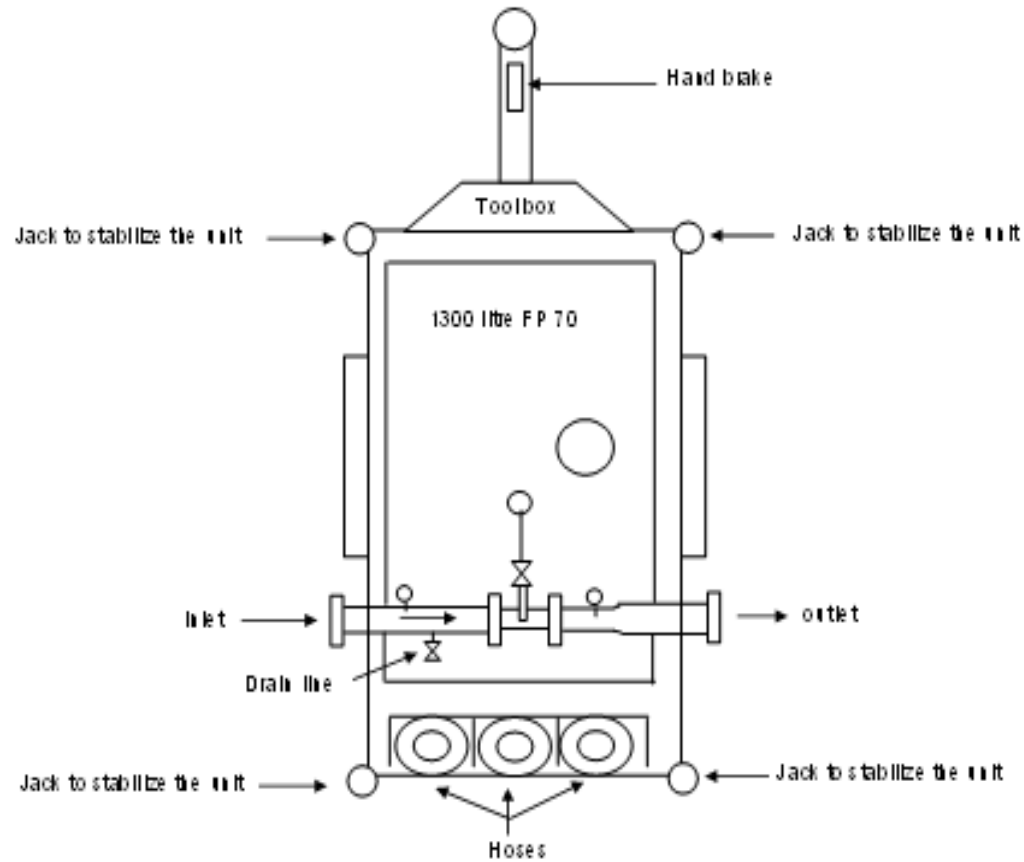
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Damaged seal







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