

Citation Corp. – THIOPAQ O&G Plant



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Biological Sour Gas Treatment with Minimal Operator Attendance

Company: Citation Oil & Gas Corporation
Location: Salem, Illinois – USA
Commissioned: June 2006

Feed Gas

Gas Type: Sour Associated Gas
Gas Flow: 0.7–0.9 MMSCFD – full availability (design value: 1.0 MMSCFD)
Pressure: 45 psig (max. 60 psig)
H₂S: 4 vol.%
Sulphur: 1.1–1.4 LTPD – full availability (design value: 1.5 LTPD)

Treated Gas

Guarantee: < 10 ppmv H₂S
Actual: 0–2 ppmv H₂S

General

Manning: 66% unmanned operation
 2 × dayshift operators (Wed–Mon)
 3 × dayshift operators (Tue)
 0 × nightshift operators (inc. facility’s entire operation – compression, liquid recovery, THIOPAQ O&G) caustic utilization 0.1–0.2 lb dry NaOH/lb S removed
Availability: > 99%

Summary

The Citation THIOPAQ O&G plant in Salem, Illinois (USA) was commissioned in 2006. At this plant, gas is biologically treated at an average rate of 700,000 SCFD. Feed gas contains 4% H₂S by volume and treated gas contains 0–2 ppmv H₂S. The Citation THIOPAQ O&G plant requires minimal human intervention – the site is unmanned 66% of the time. Since 2006, plant availability has been higher than 99% with only approximately eight days of downtime for cleaning purposes. The THIOPAQ O&G plant exhibits little or no foaming, and no corrosion has yet been detected. It is still operating with its original biology intact.

Performance

The average gas flow rate at the plant is 700,000 SCFD. At certain points during operation, e.g. when new wells are opened, flow rates increase to 900,000 SCFD. At H₂S levels of 4%, 700,000 SCFD and 900,000 SCFD are equivalent to 1.1 tpd and 1.4 tpd of sulphur respectively (approaching the 1.5 tpd design value).

THIOPAQ O&G plant H₂S emission levels range from 0 to 2 ppmv. No changes in performance were noted when the Imhoff sulphur solution levels were reduced from 1% to < 0.5%. Even after power outages, the THIOPAQ O&G plant achieved optimal gas treatment performance immediately following start-up.





THIOPAQ O&G Plant Availability

The Citation THIOPAQ O&G plant has been running without any extended shutdown periods since being commissioned in June 2006. The plant was shut down for approximately eight days to clean packing. No other operating issues have required any plant shutdowns. The stream factor has been calculated to be $(1 - 8/1300) \times 100 = 99.4\%$.

Manpower

After running for several weeks, confidence in operations was such that the intended, unmanned operation schedule was implemented, i.e. eight hours of daytime operator attendance and sixteen hours of night-time unattended operation. During the day, the entire facility – a liquid hydrocarbon recovery system, gas compression system and the THIOPAQ O&G plant – is run by two operators. On Tuesdays, a third man is on hand for sundry tasks.

Foaming

Foaming is very rare in the Citation THIOPAQ O&G plant. Occasionally, some foaming is seen when temperatures inside the bioreactor drop below operating thresholds or exceed 114 °F (46 °C). On such occasions, anti-foam is used for a day or so, perhaps once every three to four months.



Additional Information

If you would like to find out more about the Citation THIOPAQ O&G plant, then please contact one of Paqell's Business Managers – Hans Wijnbelt (hans.wijnbelt@paqell.com, +31(0)6 11 958 055) or René Bakker (rene.bakker@paqell.com, +31 (0)6 22 665471). Alternatively, please visit our website at www.paqell.com.

'Knowing what I do now, I would definitely choose THIOPAQ O&G again. In fact, I recommended THIOPAQ O&G to another company in the area.'

Bobby Shufeldt, Citation Plant Manager

Corrosion

Materials used in the facility have not shown any signs of corrosion.

Biology

Since commissioning the THIOPAQ O&G plant in 2006, the biology has not yet needed re-seeding, not even when the plant has reached temperatures of 46 °C.

Daily Rounds

The daily routine at the plant is as follows:

- Check inlet water filters
- Check seal flushes, etc.
- Run Imhoff to check sulphur concentration in Shell-Paques solution
- Check solution pH value and conductivity to verify online probes
- Examine Redox probe trends, take action if required
- Do rounds, i.e. drain regulators, non-automated filter boots, etc.
- Check compressors, bleed air traps, etc.

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Power of Nature