

Organic Dispersant Reduces High Fouling Rate Costs in Evaporator Preheater Exchanger



BACKGROUND

A plate and frame heat exchanger is used in an evaporator system to recover energy from a produced water distillate stream. This energy is used to heat incoming produced water enabling downstream equipment such as deaerators and compressors to work optimally.

SITUATION

The exchanger was fouling at high rates leading to poor efficiency and heat transfer. This caused downstream effects including low removal of acid gases and poor evaporator performance. The fouling led to higher chemical treatment, operation and cleaning costs.

Nalco Champion identified the issue as the organic matter passing through the exchanger. Although the quantity of organics passing through the exchanger was considered acceptable, the exchanger still fouled at high rates. Lowering the amount of organics passing through the exchanger would have been very expensive without adding additional equipment on site.

Prior to the trial, the evaporator preheater exchangers were fouling such that cleaning was required approximately every three days and increased chemical usage was required due to poor deaeration in the deaerator and to maintain exchanger heat transfer surfaces.

Value

\$1 Million

REDUCTION IN
CHEMICAL COSTS

Value

After only **2**
Month trial

THE CHEMISTRY WAS
APPLIED UPSTREAM OF
THE EXCHANGER AT AN
AVERAGE DOSAGE OF 2.5PPM.

SOLUTION

Nalco Champion recommended the application of an organic dispersant, to target organic fouling which successfully increased heat exchanger run time, reducing costs while eliminating safety concerns.

An organic dispersant trial was carried out over the course of two months. The chemistry was applied upstream of the exchanger at an average dosage of 2.5ppm.

After implementing the chemistry, fouling rates on a partially fouled exchanger greatly decreased. The trial was shortly terminated and reinstated on a clean exchanger. This exchanger operated for three months without a cleaning.

Upon having an oil excursion, the organic dispersant has shown the ability to slowly clean the evaporator preheater. An increased dosage of organic dispersant has been shown to help clean the exchanger heat transfer surfaces quicker.

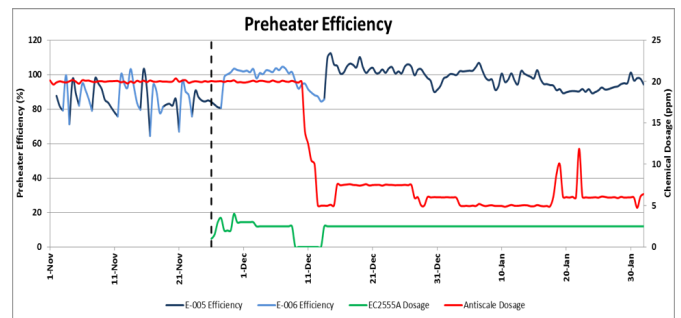
The removal of the organic fouling has had additional benefits for the evaporator preheater exchanger. With the organic fouling removed and increased stability in the system, the dosage of an inorganic antiscalant has been significantly optimized. Also, with higher temperature

produced water entering the evaporator system, the deaerator is removing more acid gases leading to higher distillate pH reducing chemical demand for pH adjustment.

CONCLUSION

Nalco Champion's recommendation of an organic dispersant was trialed and deemed successful at extending the lifespan of the evaporator preheater exchanger. The increased run time of the evaporator preheater exchangers has led to a reduction in the total cost of operation of greater than one million dollars per year.

The organic dispersant program has been adopted as a continuous operating chemical treatment.



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