
Question 39: What are some mitigating strategies for reducing corrosion in the fractionation section of a naphtha or light-ends unit?

Olivier Le-Coz (Axens)

The potential problems are most of the time located in the columns overhead where some water may condense locally. Corrosion inhibitor injections are systematically foreseen in strippers' overhead columns.

In some cases, essentially in Reforming, we foresee chlorides guard beds at the inlet of the stabilizing / fractionating section.

At some point when the potential or actual corrosion is too severe, especially due to chlorides, the mitigation strategy should go through metallurgy upgrading. In the case of reforming units, chloride guard beds have most of the time proven to be very efficient.

Brad Palmer (ConocoPhillips)

Corrosion in naphtha-hydrotreater stripper or fractionator overheads is usually the result of chloride. Chloride usually comes into a hydrotreater with makeup reformer hydrogen, with naphtha from poorly desalted crudes or with wet naphtha. The chlorides exit the hydrotreater high-pressure loop as HCl. Some HCl is dissolved in the oil and some will be carried by entrained sour water from the cold high pressure separator. Management of the chlorides can take a couple of different forms: management upstream of the NHT and tolerance within the NHT.

Upstream

- Be sure the desalter is working optimally to reduce the chloride load on the crude tower. This should reduce crude overhead corrosion, which in turn helps the NHT.
- Be sure naphtha coming from the crude unit is dry. Entrained water will bring ammonium chloride from the crude overhead. If the naphtha shows any haze, it is probably sufficiently wet to be a problem. You can expect more corrosion products with hazy naphtha.
- For cokers, the same kinds of issues can also apply if the crude is poorly desalted and the coker naphtha is wet; the coker naphtha will also bring chlorides.
- Keep the water-chloride balance correct in the reformer. If you have a net gas scrubber or chloride absorber upstream of the NHT, keep it in service and change caustic solution or sorbent when necessary.

In the NHT

- Good water wash practices in the reactor effluent should help mitigate chlorides which should prevent amine salt formation.
- Do not feed a wet stream from the cold high-pressure separator to the stripper or fractionator. Correct any water separation problems.
- Consider upgrading metallurgy in Stabilizer/Stripper tower overhead to tolerate more chloride.

Erik Myers (Valero)

At minimum, chloride treat the reforming LPG that is routed to a downstream light ends unit.

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