Question 52: What are your Best Practices for a waterwash system to control corrosion in delayed coking fractionator overhead and light-ends systems?

SAM LORDO (Nalco Champion)

The overhead waterwash for a delayed coker main fractionator system is the same as for an FCCU main fractionator overhead. The volume of water required is calculated based on what is needed to condense the water present with an added excess; typically, this is 25%. In some cases, the site, instead, bases the washwater requirement on the feed to the tower. A common ratio used is 1.5 to 2.5 gpm / mbbl (gallons per minute/1,000 barrels per day) charge. The waterwash should be applied using a spray nozzle (solid-cone maximum spray angle) either in the overhead line, in front of the overhead cooling system (fin fans or exchangers), or both. Adding it both locations maximize the effectiveness. The source of the water is typically recycled water from the overhead; however, we have seen sites using other cleaner sources (i.e., boiler feedwater or steam condensate). When this is done, the purpose is to dilute contaminates that are present.

SRINI SRIVATSAN (Amec Foster Wheeler)

We design the coker fractionator with an intermittent waterwash system. Condensate or utility water is intermittently introduced at the suction of the reflux pumps if there is any indication of salt deposition. Water, along with any hydrocarbon that is collected, is drawn off using a water draw-off tray and sent to a waterwash coalescer drum. Sour water from the waterwash coalescer drum is routed to the blowdown system, while the hydrocarbon is returned back to the fractionator using a balance line. The fractionator overhead condensers, which have multiple bays, have provisions for either continuous or intermittent waterwash to dissolve the salts in the overhead vapor stream. Care should be taken to ensure that a reasonable quantity of the washwater injected (about 25%) stays as liquid. The water rates can be adjusted based on NH4HS concentration level in the sour water.

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