Question 73: What is your best practice for coke drum velocity to minimize coke carryover to the fractionator?

Gary Gianzon (Marathon Petroleum Company)

Coke drum velocity limit depends on the capability of the coker main fractionator and downstream equipment to handle entrained coke. One of MPC's units, processing much lighter feed than design and at a higher charge rate, currently operates with a drum velocity above 0.80 ft/sec. At these velocities, the flash zone gasoil strainer needs to be cleaned twice per week and the backwash interval on the HCGO filters is less than ideal. Raising coke drum pressure will reduce velocity and coke entrainment. Two of our cokers with no coke removal capabilities in the fractionator, operate with a drum velocity of around 0.40 ft/sec. At this low velocity, accumulation of coke in the main fractionator is minimal and only requires cleaning every two years.

Jeff Lewellen (HollyFrontier)

The El Dorado facility targets coke drum velocities in the 0.5 ft/sec range. In troubleshooting coke carryover issues, a frequently overlooked contributor to high drum velocity can be unaccounted (or under accounted) sweep steam sources. Wet steam caused by steam system upsets or faulty condensate traps can also unknowingly increase drum (and fractionator) velocities.

Eberhard Lucke (Commonwealth E&C)

As a general design guideline, the vapor velocity in the open section above the coke bed should be in the range of 0.5 to 0.6 ft/s while the vapor velocity in the inlet of the vapor line should not exceed about 60 ft/s.

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