Question 27: What impacts are you seeing in naphtha processing units from contaminants suspected to come from shale crudes (e.g. tramp amines, chlorides, fouling)? What are you doing to mitigate these impacts?

Dennis Haynes (NALCO Champion)

Tramp amines, chlorides, and fouling related to processing of Shale Crudes (or more specifically, Tight Oils) are issues that are of concern on the Crude Unit. I am not aware of issues specific to the gasoline pool and blending downstream of the crude unit. The strategies to deal with the tramp amines, or chlorides, focus on appropriate monitoring and minimization of the contaminants via desalting optimization or possibly caustic use; this includes tracking of salt points in the system. Fouling may be caused by various mechanisms related to Tight Oils, one of which is asphaltene destabilization due to incompatible blending, so fouling needs to be addressed after the mechanism for the specific situation is confirmed.

Greg Savage (NALCO Champion) Tight oil can contain tramp amines, which have resulted in crude unit tower, tower overoverhead temperature control as well as the use of caustic, desalter acidification, salt dispersants, and overhead chemical automation have reduced the risks of salt fouling in crude units.

Ka Lok (UOP) Several refiners have reported increased crude fouling when processing shale crudes, primarily in the crude column. head, and pump around fouling from salt formation. Operational controls such as desalter optimization, water wash, and

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