HP DEWA

A Dewatering Formulation for Crude Storage Tanks

Crude oil is a mixture that consists of hydrocarbons such paraffins, iso-parafins, aromatics, resins and asphaltenes. The crude oil also contains impurities such as sediments, mud, water and heavy metals. Crude oil shipped through marine tankers is received in large storage tanks in refineries prior to processing. Water and sediments in crude should be removed prior to sending it to unit as it may lead to many process limitations. Water is drained by giving a settling time of 24 hrs for the crude in the storage tanks. Water thus removed is the free water and not the water associated with crude *i.e* emulsified water. This oil – water emulsion settles along with the other inorganic impurities at the bottom of the tank as "Sludge" **Fig 1**. This sludge accumulated over prolonged period of time needs to be removed & disposed off as it may lead to economic losses by means of loss of storage volume & tank corrosion.

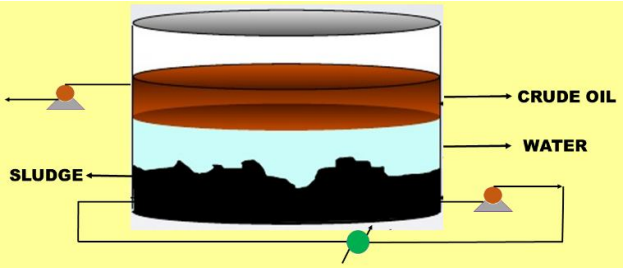

Figure 1 Schematic of crude storage tank

An effective formulation is necessary to completely remove the water and subsequently minimize the sludge formation. In this regard HPGRDC has developed an improved surfactant formulation both to enhance the free water separation and also remove emulsified water from the crude oil.

Thus developed formulation was evaluated by ASTM G170 for water separation efficiency. Fig 2 provides a graphical representation of performance evaluation for water separation efficiency in three scenarios (blank, benchmark and in-house additive)

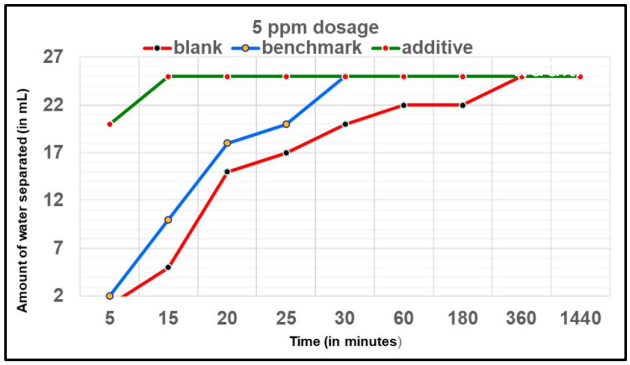

Fig 3 (a & b) and (c & d) show the images of blank and inhouse additive cases with crudes of API of 32.4 and 37 respectively. Water separation is clearly evident in both the cases.

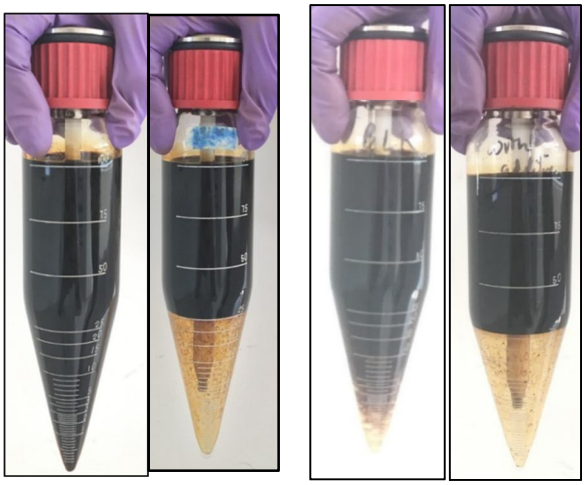

Fig 3(a) Blank (b) HP DEWA API 32.4 (c) Blank (d) HP DEWA API 37

A 10 ton batch of HP DEWA was scaled up in Feb 2020 for field trials at VR. Field trials are in progress since 21st June 2020.