



Closed Coke Slurry System (CCSS) – An Environment-Friendly and Safe Coke Handling Process for state-of-the-art enhancement of existing and new Delayed Coking Units

In recent years, worldwide crude slates have shifted to heavy and extra heavy feeds, refiners are therefore required to rely on processing heavier materials and residues. Along with the global trend to limit the use of residue fuel oils in power production and maritime bunker operations, as well as by the more stringent sulfur specifications of residual fuels coming into effect until the year 2020, bottoms upgrading technologies become more important to effectively reduce the quantity of fuel oil products by producing valuable distillate products.

Within the range of today's upgrading technologies more than 50% is realized by "coking processes", among which the delayed coking process ranks first with approximately 78% of the worldwide installed coker capacity.

Delayed coker units (DCU) process residues from atmospheric or vacuum distillation units. Available commercial processes slightly differ by the unit setup for fractionating, residue heating and coke formation. However, an essential part of the coking process with respect to process safety and environmental issues lies in the coke handling system. Most DCUs still contain open pit/pad arrangements, leading to uncontrolled emissions of coke fines into the atmosphere.

This paper introduces TRIPLAN's proprietary Closed Coke Slurry System (CCSS), providing a reliable, environment responsible and safe coke handling process to avoid coke fines emissions and steam clouds at the workplace. This system has been, already running successfully at a German refinery for the last eight years.

By implementing CCSS, the coke and the coke slurry flow are kept "under cover" throughout the entire process. Advanced water management is achieved by cleaning and recycling water contaminated with coke particles, resulting a substantial reduction of water consumption. Moreover, significantly improved reliability provides economic benefits to the refiner.

The lecture will highlight the current status of coke handling systems and will focus on the improvements and advantages of the CCS System, also reflecting practical experience from a running unit.