

Profit Pivot Points in Crude to Chemicals Integrated Complexes

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Abstract

The recent industry trends in refineries have focused on improved quality of transportation fuels and alternate outlets for products as petrochemical feedstock. On the petrochemical side there has been a surge of new large capacity steam cracker projects with the majority processing abundant low cost ethane feed or a mix of feeds ranging from ethane to gas oils. To maximize profitability, refineries are studying options for petrochemical integration. Several new projects have been announced around the world for integrated refinery/petrochemical complexes. Other major refiners are considering Crude to Chemicals projects with various levels of crude conversion to chemicals.

This paper examines the objectives and strategies available with the latest innovative technologies to maximize refinery profitability via petrochemicals. An integrated refinery/petrochemical complex has several profit pivot points that can make or break a project. On the refinery side (Feed Preparation) for a petrochemicals complex, the hydrocracker plays a pivotal role in terms of feed and product flexibility and producing an optimized intermediate stream for downstream petrochemicals. The second vital pivot point is the mixed feed steam cracker and the third pivot point is the C4/Pygas train. These 3 areas are frequently designed independently and with little consideration for the potential impact on the other areas. A coherent design and operational strategy will enable these pivot points to work in unison and provide the opportunity to maximize profit across the cycles of crude, petrochemicals and energy prices.