Abstract Title - SUSTAINING OLEFINS PRODUCTION THROUGH OPTIMIZATION AND EFFECTIVE FEED MANAGEMENT

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ABSTRACT:

This paper addresses scheduling and managing of different feedstocks to operate an ethylene plant preventing downtime due to feedstock issues. Ethane or Ethane/Propane (E+P) is an ideal feed stock for ethylene unit, however all facilities do not have uninterrupted access to these feedstocks. Unpredicted interruptions in feedstock availability can hinder the overall plant performance, posing a challenge to keep plant production as budgeted. Improper management of scheduling in addition to unknown allocation of the feedstock must be managed by plant operation to meet downstream customer requirements. Manufacturing facilities without a good infrastructure set-up, without sources of mixed-feed/alternate feed and without optimization analysis capabilities, are likely to face this challenge. In this regard, sustainability of plant production mainly depends on reliability of the source feedstock and plant ISBL/OSBL infrastructure of the stock hold up.

If plant is capable of processing multiple feeds but cracks only one feed, unavailability of that feed source should not become a constraint to achieve budgeted production. For example, if a plant cracks ethane feed most of times in a year, lower supply of Ethane feed should not act as obstacle in achieving the production goal. Operation of furnaces with low feed stock (low conversion) or intentionally increased recycles back to furnace section, from C2 and C3 fractionators, can provide some cushion however it certainly hampers the plant energy index. Right combination of E+P, and any other feedstock at optimum severity conditions in furnaces ensures greater asset utilization.

Analysis using a “Plant Feed Optimizer” is necessary when operating a plant with restricted feedstock availability, to circumvent feed supply constraints. This should be supplemented by optimization of plant operating parameters of equipment such as rotating machines, pumps, flows, temperature, and reflux. This combined optimizer can identify the major constraints across the unit for processing the desired feed rate and conversion. Objective functions could either be maximum ethylene production, maximum C2+C3 production or net plant contribution based on overall economics i.e. costing of raw material and finished products.

This paper describes a case example how such analysis helped an Ethylene facility.