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Criterion and Shell Global Solutions Combine Innovative Technologies and Experience to Deliver Effective, Reliable Options for ULSD Production

By Carol Cole, Editor, Octane Week

With the implementation timing for ultra-low sulfur diesel (ULSD) fuel decided, U.S. and Canadian refiners are gearing up to identify their best option to meet this challenge. Crude mixes, refinery layout and product sales forecasts are just a few of the variables each refining company must contemplate to decide which approach is the best fit. Uncertainties around future product margins and off-road diesel fuel regulations complicate the decision process even further.

Realizing the confusing maze that refiners face and that a 'one size fits all' approach can be costly, Criterion Catalysts & Technologies and Shell Global Solutions have put together a wide range of technology options and an evaluation process to help refining companies rapidly compare choices and create the optimum plan for each refinery situation. Whether the circumstances call for revamping existing assets or installing new facilities. Criterion and Shell Global Solutions can deliver an integrated solution that covers feed preparation, catalyst choice, process design and operations reliability. Best-in-class technology and well-designed, proven solutions have been established through Criterion's and Shell's many years of technology development efforts and vast operating experience.

Fuels Product Leadership

To date, Criterion Catalysts & Technologies and Shell Global Solutions have successfully completed over 100 fuels projects. All these have...

- Met or exceeded targets for product quality and yields
- Achieved operating costs and reliability targets
- Met project timetable & capital investment target
- Provided more processing flexibility
- Provided long-term options to prevent a stranded investment

SOME EXAMPLES:

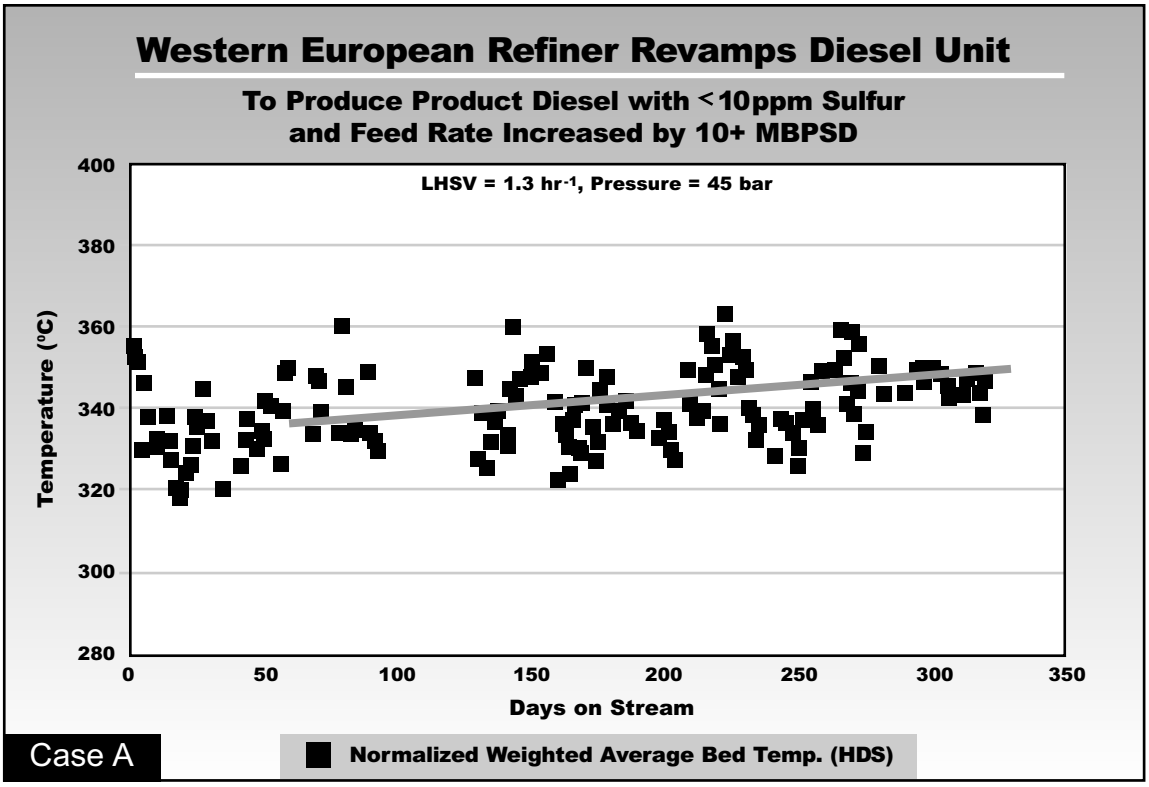
Refiner	Process Application	Revamp / New	Results
A	HC	Revamp	Capacity increase, higher quality products
B	MHC	Revamp	Capacity increase, process heavier feedstock
C	MHC	New	Upgrade gasoil, meet low sulfur gasoil specification
D	ULSD	Revamp	Major gain to Cetane/API Gravity; ULSD capability
E	ULSD	New	Produce ULSD with MK 1 capability, improve cold flow properties

Recently, changes in European refiners' operations to produce sub-50ppm sulfur diesel fuel have provided opportunities to demonstrate Criterion's and Shell Global Solutions' ability to achieve 10ppm sulfur through lower-cost unit upgrades or grassroot expansions,. Two such cases are summarized here as examples of the spectrum of commercial options for producing ULSD.

Case A

A West European refiner was interested in producing 10ppm sulfur diesel to obtain available government tax incentives. Shell Global Solutions conducted a feasibility study that covered a number of options and issues such as feedstock selection, comparisons of capital investment versus operating costs, catalyst options and potential capacity expansion. After reviewing the study, the refiner agreed to implement Shell Global Solutions' recommendation to upgrade the existing unit.

For an investment of less than $200 per daily barrel, the unit was revamped to produce 10ppm sulfur diesel and achieve a feed rate increase of more than 10,000 barrels per stream day. After one year of operation, the unit has demonstrated consistent production at the target sulfur and higher feed rate.

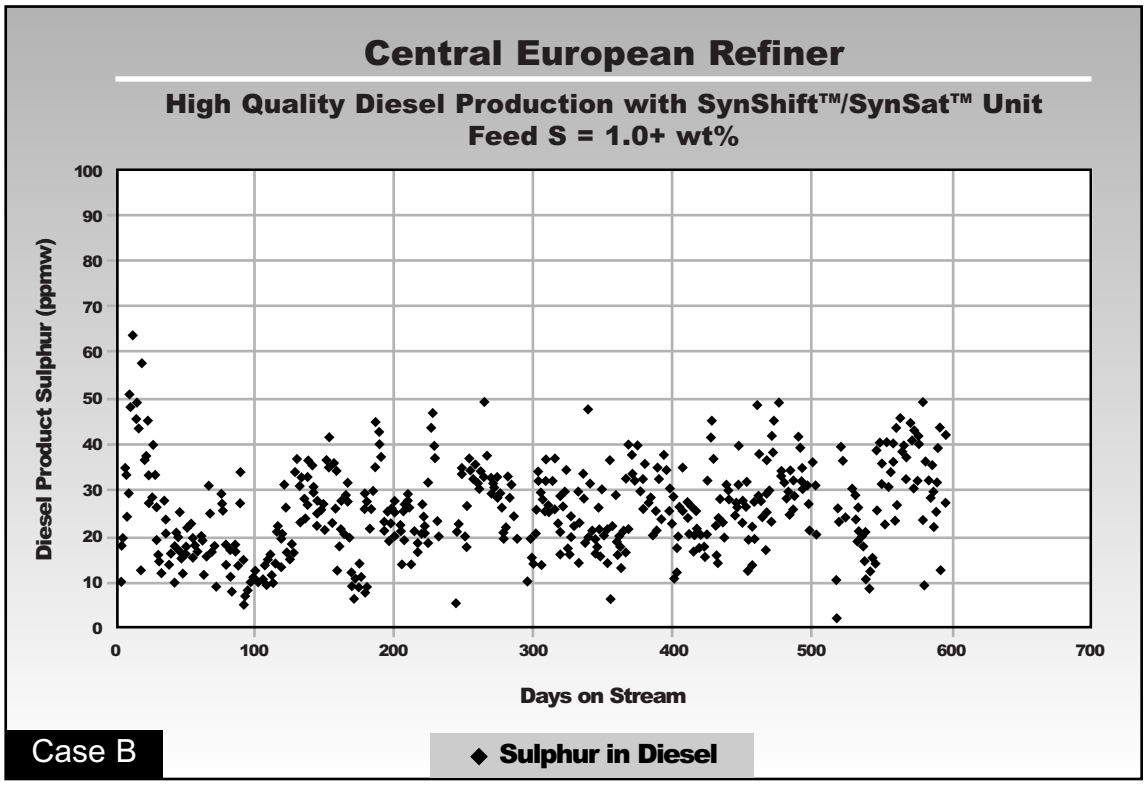


Case B

Several years ago, a Central European refining company initiated a project to improve the cetane and cold flow properties of its diesel pool. The refiner selected a SynShift/SynSat™ design because of its flexibility to meet a number of future product quality improvements and its cost-effective, robust design. The unit is a two-stage operation that uses Lummus' proprietary countercurrent process flow technology.

For nearly two years, this unit has met its operational design targets. It has consistently processed a feed with greater than 1 weight percent sulfur to achieve 20-30ppm sulfur product at moderate temperatures and pressures. Refinery test runs have confirmed that 10ppm sulfur could be routinely produced while still achieving 2 years run lengths.

Criterion and Shell Global Solutions have now successfully designed and implemented over 100 refinery projects for nearly as many different scenarios.



The technologies and know-how used in these projects can be combined in a variety of ways to deliver reliable, cost-effective ULSD solutions as demonstrated by the above cases, as well as reduced sulfur levels in heavier fractions.

U.S. and Canadian refiners must wrestle with some tough choices in the coming months, but Criterion and Shell Global Solutions believe they can provide the right ideas, technologies and support to make the decision process easier.