



FLUIDIZED CATALYTIC CRACKING: OPERATIONAL REVIEW

GENERAL – OPERATION ASSURED

Economic and environmental pressures on the refining industry are unlikely to diminish in the future. Consequently FCC operators need to find even more efficient and cost-effective ways of producing higher value, environmentally acceptable products, often from heavier, more contaminated feedstocks.

Assured Long-Term Operation combines a multitude of the following issues:

- **FCC Process Performance:**
Throughput, product selectivity, catalyst optimization, capability to process various feedstocks.
- **Environmental impact:**
Emissions (particulates, SO_x, NO_x, hydrocarbons), energy use.
- **Unit Integrity:**
Reliability, Maintenance expenditure, run length.

Unit availability and efficiency depend on getting grips with these considerable challenges.

EPS can help you to respond effectively to today's business challenges.

In addition to dealing with specific problems, EPS can support the refinery to improve the FCC Operations by providing service on:

1. Operational Reliability Review
2. Health Check of Unit Operation
3. Unit Optimization
4. Operating Training Courses

1. OPERATIONAL RELIABILITY REVIEW

The main purpose of an EPS Operational Reliability Review is to improve the reliability, mechanical availability and hence the profitability of the FCCU.



The design, general arrangement and mode of operation of the unit is reviewed to identify any weaknesses that could affect its integrity or operability and that might ultimately shorten the run length or limit its capacity.

The outcome of the review will be a detailed report that highlights areas of vulnerability, proposed solutions to specific problems and contains a prioritized action plan that covers operational aspects as well as potential improvements that could be implemented for example in a future turnaround.

The benefits are:

- Improved unit availability
- Extended Run Length
- Reduction in Unscheduled Shutdown
- Fewer unit slow-downs.

The scope of the review normally covers the FCC R&R section, the flue gas system, solids handling system and Main Fractionator-Bottom section. If desired, the Main Fractionator and the downstream work-up section and treating facilities can be included to the review.

2. HEALTH CHECK OF UNIT OPERATION

The mechanical integrity by design, safety relief systems, IPF and effective Operations determines the risks for potential hazards and undesired emissions. In order to reduce the potential risk of incidents occurring, a health check at main operating conditions enables the timely discovery of potential threats.

Examples are:

- Feedstock quality and level of contaminants
- Pressure Drop over cyclone systems & riser/reactor
- Fouling of the Main Frac Bottom Circuit
- Occurrences of upsets & feed-outs
- Operating procedures, such as for Start-Up, (Emergency) Shut-down

The current Safety and Safeguarding System will be reviewed as part of the Health Integrity review.

3. UNIT OPTIMIZATION

Key subjects addressed are:

- Benchmarking of the Operating Conditions and Cycle Length
- Fresh Catalyst Addition
- Review of Feedstock Quality (presence of salts, coke precursors, metals)
- Review of possible unit constraints.
- Energy Consumption of unit and running equipment.

EPS deliverable is a detailed report that addresses opportunities for improvement.

WHY SELECTING EPS

Reviews offered by cat vendors cover predominantly catalyst issues. EPS focusses strongly on Operational Availability and Sustainable Safety, and the review is carried out by a seasoned expert that operated many units himself. The proposed improvements will be practical and easy to implement with an expected high benefit/cost ratio. The EPS methodology will confer a sense of ownership to all participants of the Operational Review.

EPS CONSULTANT

The above support will be provided by a principal EPS consultant with world class experience in the technology and operation of the Fluidized Catalytic Cracking Units.

Working for Shell (1975-2010) the consultant has been responsible for provision of technical support to over 10 FCCUs worldwide, including design, commissioning and start-ups of new units.

The consultant has contributed to the development of a guide for the Process Safety and Instrument Protective Function (IPF) for FCC and has carried out compliance audits in various locations.

The EPS consultant for this activity has experience with remote monitoring of several process units. In case the customer requires support in other areas than Fluidized Catalytic Cracking, experienced EPS Consultants with other expertise are available to provide support.

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