



Key Takeaways of the ACM on “Delayed Coking – Advances towards Refinery Profitability Improvement” held at Barauni Refinery on 19th -20th January, 2023

In collaboration with IOCL, Barauni Refinery, CHT hosted an Activity Committee Meet (ACM) On "Delayed Coking Coking – Advances towards Refinery Profitability Improvement." Mr. R. K. Jha, ED & RH, Barauni Refinery, inaugurated the meet. The eminent visitors, speakers, and representatives from Leading Licensors, various refineries, R&D facilities, consultants, and vendors were welcomed by Mr. Satya Prakash, CGM (Technical), Barauni Refinery., Mr. Alok Sharma, Executive Director of CHT gave the meeting's theme address. Subject matter experts in delayed coking technology, Mr. D. Bhattacharyya, ED (TIC), IOCL (R&D), gave the special address. Mr. S. G. Venkatesh, CGM (TS), IOCL, Barauni Refinery, then offered the vote of gratitude.



ACM Group Photo

During the meeting, prominent licensors like Wood (formerly known as Foster Wheeler), Lummus, refineries, R&D centers, CHT, and consultants (Solomon) presented a total of 23 presentations.

A well-planned agenda kept the meeting focused and ensured that all important topics were covered. Through active listening and open-ended questions answer session, everyone's ideas and perspectives were heard and encouraged. From the meeting key takeaways were taken are as under:

Key Takeaways of the Activity Committee Meet are summarized below:	
Al Faegh, Chevron Lummus Global, USA	<ul style="list-style-type: none"> ✓Coker have been designed & revamped for processing heavier feedstocks for speciality products like Needle Coke & Lithium Ion Battery carbon precursor. ✓Recent innovations w.r.t digital remote monitoring/real-time optimisation, coke drum with vertical plates, Insulated Transition Spool

	<p>Piece (ITSP) and Centre Feed Device (CFD) for reducing drum stresses were mentioned which refineries can explore to improve unit performance and reliability.</p>
<p>Fred Dobbs, Solomon, USA</p>	<ul style="list-style-type: none"> ✓ Comparison made between world's best 2-3 coke drum with rest of the world w.r.t reliability, maintenance expenditure & turnaround times. ✓ It can be concluded that world's best Coker have <ul style="list-style-type: none"> a) Shorter turnaround times b) B) fewer maintenance & process related downtime c) Higher feed preheat temperature
<p>Amal Roy, Advisor, CHT</p>	<ul style="list-style-type: none"> ✓ Presentation on "What went Wrong" emphasized on periodic checking of Spring supports of coke drums lines/structures, optimization of heating/cooling cycles, not to operate with lower coke drum inlet temperature for a longer duration to prevent foaming in the Coke drum leading to coke carryover. ✓ Experience with inadvertent opening of running drum antifoam nozzle led to potential hazardous situation & improper metallurgy in the column bottom pump discharge line led to catastrophic failures emphasizing that operational discipline and maintenance can prevent any untoward incidents in Coker Unit.
<p>Abhijit Kumar Ram Engineers India Limited</p>	<ul style="list-style-type: none"> ✓ EIL offered Licensed technology of Delayed Coker Unit along with Basic Engineering Design Package. ✓ The technology license is offered by EIL in collaboration with R&D Division of IOCL ✓ All state-of-the-art features which is at par with worldwide Licensor was offered by EIL in Coker technology
<p>Karthik Srinivas R, CPCL</p>	<ul style="list-style-type: none"> ✓ CPCL shared their experience on Online heater spalling which is usually being carried out ~3 times between mechanical pigging & Average skin temperature drop after each spalling is ~25 -45 °C ✓ Trouble shooting experience shared on LCGO purge to Coke drum MOVs, Coke cutting water chloride reduction ✓ Best practices discussed related to Increase of Heater Coil Inlet temperature, Slop processing maximization., Routing of LCN and HCGO to FCCU, Splitter bypass provision
<p>Rupam Mukherjee, Mandip Kapoor, EIL</p>	<ul style="list-style-type: none"> ✓ EIL Shared the factors influencing Coker Heater Run length & best design practices like flat flame burner, increased clearance from Coil to burner, double fired configuration for better heat flux distribution. ✓ EIL also shared BR Coker-A revamp and reverse temperature profile w.r.t high skin temperature in the top rows of tubes.
<p>Rajasekhara Babu M, BPCL, KR</p>	<ul style="list-style-type: none"> ✓ BPCL-KR Shared their experience of Decontamination of Coker Fractionator, various Energy Improvement Initiatives and digital innovations of Heater skin prediction model using Python, Digital Twin for predicting product properties & abnormality detection through AI.

<p>Joydeep Roy, Barauni Refinery</p>	<ul style="list-style-type: none"> ✓ Shared salient features of Coker-A revamp by EIL ✓ Presented Trouble Shooting Experience like LPG recovery compressor frequent surging phenomenon, dislodging of DCV (De-Coking Valve) from its position, frequent breakage of Bridge crane rail etc. ✓ Upcoming Coker-B under BR-9 project was also discussed
<p>Ruhrpumpen, Germany</p>	<ul style="list-style-type: none"> ✓ Shared latest innovations in the Combination Cutting Tool, Crossheads for drum movement, Remote location of Coke Cutting Cabin, VR training simulator & innovative Drill Stem thread design named "RPX"
<p>Sahil Siddiqui, IOCL (R&D)</p>	<ul style="list-style-type: none"> ✓ Indian Oil Corporation Limited, R&D Shared about their in-house Ind-Ind-Coker^{AT} Technology which gives the following yield benefits: ✓ Reduction in coke yield ~5.2 wt% ✓ Improvement in diesel (LCGO+HCGO) yield ~2.5 wt% ✓ LPG yield improved ~0.6 wt%
<p>Mirza Antonia, Haldia Refinery</p>	<ul style="list-style-type: none"> ✓ Indian Oil Corporation Limited, Haldia refinery shared Yield Calculation/Optimization and Optimum point for Coke Reduction
<p>J. P. Jayaprakash, AMPO POYAM Valves</p>	<ul style="list-style-type: none"> ✓ POYAM Valves shared capability of their lift plug valves and benefits w.r.t lower pressure drum due to full bore design, lower steam consumption and better reliability as compared to existing designs.
<p>Shanki Dua, Nayara Energy</p>	<ul style="list-style-type: none"> ✓ Nayara Energy shared their experiences as under: <ul style="list-style-type: none"> ✓ Level fluctuations in Blowdown overhead Sour Water was minimized by implementing in-house developed equations. This has resulted in lower hydrocarbon carryover to downstream units. ✓ Monitoring of Coke Drum Displacement by Installing to monitor drum movement during hot spot/hot bed event at two elevation i.e. 45 M and 60 M respectively. ✓ Centre Feed Device (CFD) installed & commissioned in turnaround to improve thermal profile during coke drum operation. ✓ High Integrity Pressure Protection System implemented in Debutanizer Column to reduce the flare load from DCU on total power failure and create margin in Refinery LP Flare Header load to accommodate additional flare load from new upcoming PRU
<p>Srini Srivatsan, Wood</p>	<ul style="list-style-type: none"> ✓ Presented Needle Coke Technology and plastic processing in Delayed Coker.
<p>Swaminathan Natanam & Parimal Jain, BPCL, Bina Refinery</p>	<ul style="list-style-type: none"> ✓ BPCL -Bina refinery shared their on-line spalling experience and best practices followed during online spalling, also shared troubleshooting experiences w.r.t coke drum vapour valve closure issue, 3 drum Coker Operation, reduction in coke cutting time of new drum by revisiting Kelly lower limit switch setting.
<p>Arvind Kumar Saxena, Paradip Refinery</p>	<ul style="list-style-type: none"> ✓ Indian Oil Corporation Limited, Paradip refinery shared their initiatives under refinery profitability improvement program like: <ul style="list-style-type: none"> ✓ Coke drum cycle time optimization through Machine Learning ✓ New DCU stripper feed-bottom exchanger (E-030) Installation ✓ Coke Yield reduction by reduction in WGC Suction pressure ✓ Also shared PDR Unique Sludge/Slop processing facility & Rapid Rail loading System (RRLS) facility
<p>Nimesh Kumar Trivedi, HMEL</p>	<ul style="list-style-type: none"> ✓ HMEL, shared initiatives taken to trouble shoot like <ul style="list-style-type: none"> ✓ WGC rotor fouling

	<ul style="list-style-type: none"> ✓ MF top section high pressure drop issue, ✓ Velan valves stuck up issue, ✓ Hot spot minimisation in coke drum. ✓ Best operational practices were also shared.
Samrat Manji, NRL	<ul style="list-style-type: none"> ✓ Numaligarh Refinery shared their experience on processing of VR from low Sulfur Assam Crude in DCU for production of Anode grade coke ✓ Also Presented the recent development in Delayed Coker
Ronit Ranjan Prusty, Digboi Refinery	<ul style="list-style-type: none"> ✓ Indian Oil Corporation Limited, Digboi refinery shared trouble shooting experience on high furnace outlet pressure ✓ Described the efforts towards improvement of on-stream factors of DCU
Sauravh Parihar, Gujarat Refinery	<ul style="list-style-type: none"> ✓ Indian Oil Corporation Limited, Gujarat Refinery shared experience on revival of HCGO Backwash filter in DCU