

Cutting edge technologies to drive India's EPC industry: AspenTech

AspenTech is the world's leading supplier of software that optimizes process manufacturing. With integrated aspenONE software, process manufacturers can optimize their engineering, manufacturing, and supply chains. AspenTech customers are better able to achieve operational excellence — increasing capacity, improving margins, reducing costs, becoming more energy efficient, ensuring safety, and shrinking their carbon footprint.

Chemical Industry Digest interacted with AspenTech's Ron Beck and Sunil Patil to find out how cutting-edge technology is creating value for Indian EPC companies. The duo evaluate the impact of falling crude prices on the chemical and process industries, deliberate on technologies acting as key differentiators between companies and discuss why operational excellence is pivotal in helping manufacturers remain resilient and competitive.



**Ron Beck, Industry Marketing Director,
EPC, AspenTech**

Chemical Industry Digest (CID): EPC projects globally have been impacted by the lack of investments, a volatile market and falling crude oil prices. How would you evaluate the impact of the current situation on the chemical and process industries? What are the various strategies that contractors are adopting to mitigate the risks in this current business environment?

AspenTech (AT): Across the chemical and process industries, investments in capital project continue, but on an increasingly selective basis. In the upstream area, investments are focused on those national oil companies and global companies with deeper pockets. In refining, investments tend to be focused on shifting refining capacity to handle a different mix of crudes. However, in the chemicals space, lower price feedstocks have fueled significant investment in the petrochemical supply chain, especially where natural gas is in excess supply, such as the US.

In the observed scenarios we have outlined, owners are putting EPCs under pressure to reduce project capital costs. A key trend is



**Sunil Patil, Business Consulting Director,
APAC Engineering, AspenTech**

Across the chemical and process industries, investments in capital project continue, but on an increasingly selective basis. In the upstream area, investments are focused on those national oil companies and global companies with deeper pockets. In the chemicals space, lower price feedstocks have fueled significant investment in the petrochemical supply chain, especially where natural gas is in excess supply, such as the US.

focus on use of standardized designs, which feeds into the sweet spot for Asian EPCs due to the ability to provide Asian-fabricated modular process designs. Another key trend is to increase the focus on efficiency and automation in FEED. FEED stage of projects are seen widely across the industry as the key to managing and reducing project capital costs. AspenTech has seen a huge surge of interest in the areas of project bidding efficiency and on FEED execution.

CID: Are Indian companies more inclined to adopt technology (compared to their global peers)?

AT: Indian companies are observed to be excellent at understanding the role of technology and how innovation (e.g. best in class software) can help companies achieve world class operations excellence.

One good example is Reliance Industries Ltd, an Indian conglomerate holding company. Reliance businesses span hydrocarbon exploration and production, petroleum refining and marketing, petrochemicals, retail and telecommunications. They strive to maintain innovation-led growth in each of these areas and achieve global leadership by maintaining their position as the largest polyester yarn and fiber producer in the world and a leading producer of ultra-clean fuels. In fact, Reliance Industries uses the aspenONE Engineering suite of products in many of their businesses when designing new plants, revamping existing plants, and troubleshooting underperforming units. Using solutions like Aspen Plus, Aspen HYSYS, and Aspen Capital Cost Estimator (ACCE), Reliance can address a multitude of design, operational, and estimating challenges across their E&P, petroleum refining, and petrochemicals businesses to increase production and drive down operating and capital costs.

We also observe that Indian engineering centers are more flexible and amendable to change – in comparison to their American and European counterparts, who tend to have very traditional workflows. In addition to the observations that Indian engineering organizations are more amendable to change and embrace it, these companies also have a major opportunity to gain a competitive advantage, in terms of project efficiency.

In our seminar series on engineering innovation, which is currently being rolled out globally, we have observed

unprecedented interest in India. This demonstrates that the Indian marketplace has a strong appetite for innovation, education and in gaining a competitive advantage.

CID: How can technology help differentiate emerging Indian EPC companies and propel them globally?

CID: Historically, global engineering organizations have established large centers in India due to the technical proficiency of the Indian engineering community. Cost advantage is another plus. As their cost structures rise steadily and approach international norms, Indian engineering companies will need other means to maintain a competitive advantage. Integrated process engineering solutions offer the following benefits – first, it improves project execution efficiency and cost. Second, it optimizes designs, in order to achieve better CAPEX and OPEX solutions for clients. Third, it results in better quality engineering with the electronic handover of engineering data between engineering disciplines.

With integrated aspenONE software, process manufacturers can optimize their engineering, manufacturing, and supply chains. AspenTech customers are better able to achieve operational excellence – increasing capacity, improving margins, reducing costs, becoming more energy efficient, ensuring safety, and shrinking their carbon footprint. This whole technology driven business value proposition helps differentiate emerging Indian EPC companies and propel them globally.

CID: Why do EPC companies need to improve front-end engineering business processes? Similarly, please discuss the concept of modularization and why is it considered cutting edge?

CID: Industry studies by consultants, such as Ernst and Young (EY Consultants) and Independent Project Analysis (IPA) have called out inefficiencies in the FEED stage of projects – as a key culprit in over budgeting and being behind schedule projects. Simply put, if FEED is executed efficiently, projects tend to stay on schedule. However, if FEED is inefficiently conducted – or if, many changes occur during this stage, projects get delayed and this delay cannot be recovered, resulting in cost overruns.

Front End Design (FEED) is one of the most important but least automated parts of capital project execution. An engineering team can leverage process software to accelerate FEED by capturing design components as building blocks for future projects. According to Ashish Shah, a se-

Standardized designs improve front-end engineering efficiency and execution. This helps to get projects to the construction phase more quickly and with a lower engineering cost. Additionally, standardized designs improve construction management – by increasing the proportion of fabrication work performed in the shop versus in the field. This is especially so, when combined with the impact of modularization and simplified construction management.

nior project director at Fluor, Aspen Basic Engineering (ABE) software allows his team to cherry pick data from previous projects to create designs for new projects. In doing so, it reduces rework and eliminates the need to develop designs from scratch. This allows EPCs to deliver basic engineering packages faster – using fewer resources. Shah was also the point person for Fluor's Reliance projects in India for several years.

Modularization is the process of implementing standardized designs to process units, as it reduces design, schedule and cost uncertainty. This saves a significant amount of time, money and can help to achieve a faster startup. The lesser opportunity cost is that owners are giving up the best possible design (or supposedly, gold plated standard), which also has a higher CAPEX. The better alternative is pre-designed processes, known to fulfill the function and deliver a lower lifecycle cost. Standardized designs improve front-end engineering efficiency and execution. This helps to get projects to the construction phase more quickly and with a lower engineering cost. Additionally, standardized designs improve construction management – by increasing the proportion of fabrication work performed in the shop versus in the field. This is especially so, when combined with the impact of modularization and simplified construction management.

CID: Discuss operational excellence and how it helps manufacturers to be more resilient and competitive. What are the major risks for the EPC industry and how can AspenTech help EPC companies mitigate the risks? In addition, how do the contracting models in India compare to global ones?

CID: Operational excellence is a system approach that consistently reaches the highest possible return from a plant asset. Many energy and chemical companies have many trillions of dollars' worth of capital investment tied up in their process plants. To achieve excellence across the enterprise involves strategies that address all aspects of the business and those people working at the plant floor up to the boardroom. With a system of integrated tools that innovates from design through production, manufacturers can achieve excellence in asset optimization that delivers increased profit. Operational excellence

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can be impacted by engineering in many ways. This starts from the design, where the best operators look for "operability" and "maintainability" as key design parameters.

To mitigate risks, EPC companies need to improve estimation methods to increase accuracy. This helps to improve the odds of winning bids and better project outcomes. Secondly, there is a need to deploy modularization to contain project and capital costs. Third, better tools and systems are needed to manage projects and improve global execution. Fourth, there is a need to better manage the process of designing safety systems, as the design of safety systems is a fundamental business requirement. EPC companies will need to ensure that safety calculations are well executed and legal. Fifth, there is a need for agile cost management such that estimation can proceed concurrently with process engineering. This helps to mitigate the constantly changing bid variables in the current buyers' market today.

As industry trends do not occur in isolation, Indian EPC companies will need to keep up or surpass global competition. Thus, local owner operators will expect all EPC companies in the bid – to be well equipped with global best practice to build world-class plants. Thus, operations excellence is an imperative for Indian EPC companies, especially those with both local and overseas customers.

CID: How can EPC companies manage manpower shortage and inadequate work tools?

CID: EPC companies need to deploy the right integrated software tools to plan better and lock in more efficient capital decisions. The right knowledge and skills can drive the right behavior and dramatically improve results from the plant floor to the boardroom. History dictates that companies often struggle in a growth market after an industry slump because they are ill-equipped to compete and fulfill customer demands. Thus, it is only rational that forward thinking EPC companies capitalize on a downturn to redeploy skilled expertise to crucial parts of their business.

For example, if the upstream industry sees a downturn – while the downstream industry experiences an upturn, smart engineering companies will need to safeguard their upstream professionals, in order to bid successfully for projects when the industry recovers. This means that now is the time for EPC companies to be ready and well equipped – tooled up and talent rich. This is because the oil and gas industry is asset intensive and needs to be efficiently maintained, so people can be constantly improved through quality training and investment.

Training is always a key issue.

By providing employees with the right training opportunities, companies can better retain human capital

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and accelerate the learning curve of new graduates in the shortest time possible. AspenTech has also been collaborating with Indian customers to provide more training, in ways which best suits a company's work practices. One key approach is online training, which AspenTech is increasingly investing in. Online training can be assessed by engineers, regardless of constraints in locale and time. We are also investing in flexible technical seminars – or more colloquially known as, "Lunch and Learn". The key flexibility with this approach is that we can customize these sessions, based on project schedules and the work days of engineering teams. Effective teams go beyond the availability of the right software; it is also about the right training and the opportunity to capture knowledge.

CID: What are the services provided by your company for the EPC industry in India? What proportion of your software services pool is dedicated for India? How do you view the evolution of India's EPC industry in the next five years?

CID: In India, we offer several types of services. At the basic level, as part of our customer relationship program, we include business consultants, who provide complimentary technical expertise to customers. This program also includes paid access to our professional services team, who can help implement the software and support specialized projects (such as energy optimization, dynamic modeling) that EPC companies provide to customers.

Overall, AspenTech's Professional Services team provides solution implementation, process consulting; program and project management. For solution implementation, our team helps customers derive more value from their existing assets and systems. For process consulting, optimal changes are recommended to improve the design of customers' assets. With program and project management, customers are ensured successful solution delivery with risk mitigation underway.

We are generally bullish about India's EPC industry in the next five years; as we anticipate demand to help work off the surplus crude oil in the global system. With a less bearish outlook, we should see more construction underway. The downstream industry is buffered by the burgeoning middle class growth in India and the rest of Asia.

