

EPC Perspectives: Generating New Revenue Streams From Plant Operations & Maintenance

“Engineering, procurement and construction (EPC) companies are looking for new revenue streams and turning to equipment optimization in existing plants, thus bridging the gap between design and operations.”

- ARC Advisory Group,
November 2017

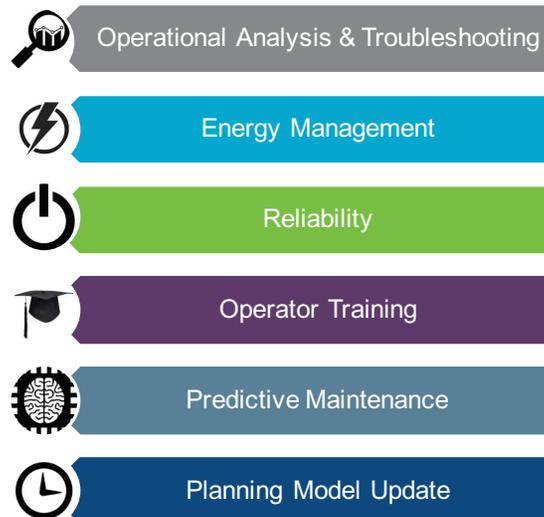
State of the Market

The current climate of fewer and smaller capital projects in the process plant industry is forcing engineering, procurement and construction (EPC) firms to look to new areas for growth. Because there are so many more assets in operation than are currently being planned, designed or built, these firms are, understandably, looking to develop offerings targeting the operations and maintenance phases of the asset lifecycle.

In a recent survey by AspenTech and Oil & Gas Journal, 93% of EPC executives said that finding new sources of revenue from operations and maintenance (O&M) was an important initiative.

The survey of EPC executives also showed that the top areas of focus for new revenue streams include operational monitoring and troubleshooting, reliability, operator training and predictive maintenance. Here, we explore how EPCs can leverage their existing modeling skills to enhance and optimize the operation of plants in these core areas.

Areas of Focus for EPCs Targeting New Revenues From Operations & Maintenance



EPC Best Practice: Leverage your expertise in modeling to add value in operations and maintenance.

“Models contain a lot of process know-how and represent a significant part of that knowledge base. Companies are beginning to manage these assets more effectively and make them readily available to production workers, so they can evaluate ‘what if’ scenarios, make process improvements and help troubleshoot production problems.”

- ARC Advisory Group, November 2017



Growth Area No. 1: Use of Models for Operational Analysis & Troubleshooting

One of the most beneficial uses of modeling during operations is for enhanced decision support. There is simply too much at stake to rely on operator experience alone for optimizing operations. From health and safety to throughput and profitability, operational decisions affect the metrics most important to your customers.

Model-based decision support leverages online and offline models to facilitate “what if” scenario planning, as well as unit monitoring and troubleshooting, to yield better results. Putting this information into a useful format and making it accessible to operators allows the improvement program to scale, resulting in faster and greater return on investment for the asset owner. Helping your operator customers optimize the performance of their equipment is another way to generate more revenue from your modeling skills. Fouling of heat exchangers in the refinery preheat train alone is estimated to cost operators \$4.5 billion USD per year. EPC firms can leverage their modeling skills to predict fouling levels over time and recommend optimized cleaning schedules that can save operators millions.

Another critical piece of equipment for monitoring and optimizing is the distillation column. Troubleshooting poorly performing columns can help your customers get the most from their assets. Use your modeling skills to help find optimal configurations that allow for operation closer to constraints — thereby increasing capacity while meeting product specifications. You can also help determine the root cause of operational issues such as column weeping and flooding while avoiding disruptive and expensive physical inspection of the column.

***EPC Best Practice:** Tune your model using actual plant operating data, then use the updated model for equipment troubleshooting and “what if” scenarios.*



Growth Area No. 2: Energy Management Services

According to Hydrocarbon Engineering, energy costs for operating a typical refinery can exceed \$50 million USD annually, accounting for half of the non-feedstock operating budget. This represents a significant opportunity for engineering companies to add value, as most operators are still making decisions that impact their energy use based on engrained historical practices, rules of thumb, perceived reliability impacts or the opinions of experienced personnel.

Creating a model of the plant's utility system and connecting it to plant operating data can provide the guidance required to achieve the lowest operating costs while meeting reliability and profit targets. Often, the operator lacks the modeling skills and tools necessary to achieve the optimal economic operation of the facility. The opportunity for the EPCs is to leverage their skills and tools to help the operator unlock energy savings of 2-5 percent.

EPCs can also assist by expanding design models into plant-wide process and utility models and developing plant-wide energy optimization strategies. These modeling activities can also surface opportunities for revamp and debottlenecking CAPEX investments for energy-improvement projects that can generate new revenues for the EPCs. Such investments often provide payback within one year and can be very attractive to the operators.

Additional savings can be achieved by connecting the model to the advanced process control (APC) system so that operating conditions and utility use can be optimized daily, or even minute by minute, without operator intervention.

EPC Best Practice: Use of utilities-modeling software to support operational decisions, emissions planning and utilities trading can achieve 2-5 percent annual savings for the operator.

Growth Area No. 3: Reliability, Availability & Maintainability

When it comes to asset maintenance, unplanned downtime can drain millions of dollars from operators' profits and represents one of their most acute pain points. Operators often make suboptimal decisions based solely on experience of personnel or historical procedures. They may also hurt plant performance and drive up costs by making decisions based on static, localized views of a situation. When it comes to optimizing a maintenance program, today's plants are just too complex for intuitive, isolated decision-making.

Reliability planning and decision-making needs to be considered in the context of the entire system, inclusive of operations, logistics, market conditions and even weather. Sophisticated modeling capabilities, often the domain of the EPCs, are typically required for creating and updating the process, equipment and reliability models needed for optimal results. You can use these models for enhanced decision support, or combine them with actual plant operating data and analytics to provide value-adding analysis and recommendations to your operator clients in the following areas:

- Optimizing planned maintenance intervals and activities
- Identifying which sub-processes or equipment have the highest influence on process availability
- Reducing spare parts inventory
- Including market dynamics to quantify economic benefits of potential solutions
- Optimizing maintenance decisions in the context of site-wide conditions, instead of an isolated unit or piece of equipment

This is not only a way to generate a new revenue stream, but it also increases the likelihood of winning additional work on upgrade projects. Benefits for your customers include increased uptime, shorter turnarounds, the ability to run the asset closer to designed capacity and fewer equipment failures.

***EPC Best Practice:** Combine your detailed knowledge of models and equipment with actual operational data to provide highly valuable insights and recommendations regarding planned maintenance intervals.*



Growth Area No. 4: Dynamic Modeling for Operator Training & APC

Commissioning and startup delays often frustrate operators and can cost millions of dollars in lost revenue. Unforeseen conditions, unplanned incidents and inexperienced personnel can all contribute to problems and delays.

Delivery of an operator training simulation (OTS) system can help provide a smoother startup and accelerate the time to revenue for both you and your customers. Use your dynamic modeling expertise and best-in-class OTS software for the fastest path to commissioning and operations. Keeping the OTS model up to date can also help you stay close to your customers, while improving both safety and operator effectiveness.

Another downstream use of both steady-state and dynamic models is to improve the workflow of developing and deploying advanced process control (APC). Process models developed during the design phase can serve to define the APC control strategy and to obtain “seed” models for calibrating the controller online. Validated dynamic models can further be employed by process engineers for enhanced operational decision support. Use of a consistent dynamics model also helps avoid the disconnects and unforeseen issues with control systems and operations that come from the use of disparate tools and models by process and control engineers.

EPCs are well positioned to provide ongoing value to the plant owner by delivering and updating a dynamic model for the life of the asset. Such modeling yields continuous benefit to owners and keeps EPC firms engaged throughout the asset lifecycle.

***EPC Best Practices:** Leverage steady-state models to create dynamic models for use in OTS. Decouple the OTS software from the DCS software for a best-of-breed approach to plant startup and operations.*



Growth Area No. 6: Planning Model Updates

Many process plants operate in markets where demand for end products and available feedstock supplies fluctuate. To deal with these changing market conditions most plant operators use sophisticated planning and scheduling software to optimize their production plans. Changing feedstocks and outputs means that plant operating conditions will also fluctuate, and operators must ensure that their existing plant infrastructure can manage potential new feedstocks. Models used for planning and scheduling must therefore be updated to support optimized production planning.

EPCs can help owners better optimize production plans by keeping the models used in planning up to date. By using process models that incorporate actual operating conditions, operators will get more accurate results for planning and scheduling, which is critical to achieving a higher return on their assets. Refinery-wide modeling is also an opportunity for EPCs, who can help guide their customers in developing new strategic plans inclusive of CAPEX upgrades to capitalize on broader market dynamics.

EPC Best Practice: Use integrated process simulation and plant planning and scheduling software to optimize production and profitability.





Barriers to Offering Services in O&M

According to the AspenTech/Oil & Gas Journal survey, EPC executives indicated that they faced multiple barriers to offering O&M services — from the lack of relationships and sales opportunities to their staff not having the right skills and software tools. However, process modeling is a core competency within most EPC firms, and the solutions presented here are deeply dependent on process modeling skills. In addition, software providers like AspenTech provide a full range of software and technology supporting the full asset lifecycle, from design through O&M. So, in fact, most EPC firms have access to the core skills and technology required to support the operational areas discussed earlier.

Our survey also found that more than half of executives stated that finding new revenue streams from O&M was a corporate initiative. Therefore, finding new contacts and sales opportunities are non-engineering challenges that will likely receive support from the sales and marketing functions.





Next Steps

The world's leading EPC firms are now busily reconfiguring themselves to withstand the current business climate. While many of the strategies employed are focused on reducing costs, there is also an urgent need to find new sources of revenue. Throughput, quality and safety will always be critical issues for process plant operators, so offering services in support of these key operating areas can provide immediate opportunities for revenue diversification and growth. Combined with other initiatives, this represents a solid strategy for enhancing future stability.

Put your existing modeling capabilities and technology tools to work to help your customers make better operating decisions, train and maintain an effective workforce and minimize unplanned downtime. Use of online and offline models, powerful OTS and predictive maintenance software, and historical and real-time data will help you add significant value to your customers and drive new revenues for your firm. You can also stay closer to these customers and better position your firm to win new CAPEX work at existing and new facilities.

AspenTech software is relied on more than any other for modeling in the process industries. From our market-leading Aspen HYSYS® process simulation software to our differentiated offerings for OTS, integrated planning and scheduling, plant reliability and asset performance management, AspenTech is your partner for growth.

Visit www.aspentech.com/EPC today to sign up for a one-day workshop and to learn how companies like InProcess and Genesis are leading the way for EPC growth in the areas of operations and maintenance.

AspenTech is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets faster, safer, longer and greener.

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