



The world is feeling the effects of low commodity prices with respect to oil and natural gas. For those that depend on these commodities to run their business, it is obviously a very tough and trying time. Current crude pricing in the US is trending toward US\$30/bbl, with natural gas prices consistently staying below US\$3/dth. In this environment, oil and gas companies have had to find ways to survive and to keep projects economical. As there are limited actions that can be taken to increase project income relative to commodity price, the most obvious way to increase the potential economic viability of a project is to reduce capital expenditures and ongoing operational expenses. Cost reduction measures can be applied in drilling/lifting, gathering or processing of gas associated with crude production. There are several ways to reduce the costs associated with gas processing; however, one way to enjoy immediate cost reductions is to utilise a full engineering, procurement and construction (EPC) contractor for the design and installation of processing facilities, whether it be a simple compressor station or a full cryogenic processing plant.

Fully integrated solutions

A full EPC solution helps the economics associated with gas processing in a multitude of ways. By utilising a full EPC contractor, an operator can reduce management costs and headaches associated with the utilisation of multiple vendors by providing a single point of accountability. Today, many operators do not have a large workforce to manage their



contractors and vendors, and having one full EPC contractor greatly reduces the stress placed on the staff. The full EPC contractor also allows the operator to fully capture project efficiencies by avoiding gaps and overlaps in the execution of the project. Gaps in project execution can end up being very costly, depending on when they are discovered through the project cycle, and can cause major delays in a project. These delays can result in late delivery penalties, lost revenue or even lost customers. Overlaps in the execution of a project are clearly costly because the operator is paying two vendors or contractors to perform the same function. In addition, a single full EPC contractor, that has all aspects under one roof, can offer a more competitive contractual arrangement since the operator can avoid paying layered profit margins to multiple companies. Having a single point of accountability helps reduce schedule risk, and reduced schedule risk typically translates into less cost.

Having a fully integrated EPC contractor will also help operators to provide a better overall gas processing solution to their customers. In the US, gas processing has become highly competitive and, as a result, operators must have an advantage; this could be lower operating costs, or offering better recoveries for their customers. A full EPC contractor should be able to provide a solution that provides this edge. First, the operator can enjoy an optimised project schedule with less missed deadlines and the typical 'finger pointing' that happens when multiple contractors are involved. A single EPC contractor has the capability to actually perform a project on a design/build basis, thereby expediting the project schedule and enabling the operator to begin to recognise revenue as soon as possible. Historically, the problem with a design/build model is the reluctance for a separate construction contractor to construct the facility under a lump sum contract, as a full set of issues for construction drawings is rarely available for bid and may not even be available prior to breaking ground on the facility for projects with aggressive schedules. In this situation, the field contractor will push for a time and material arrangement that almost never benefits the operator, as these types of contracts provide little to no incentive for the contractor to control costs or schedule. These types of contractual arrangements are notorious for leading to schedule and budget overruns. Another significant advantage in using a full EPC contractor is that the operator will acquire a facility that is more fully integrated. Having a fully integrated facility will lead to better overall operating efficiencies and a smoother operation in general. This not only provides a better product, but also helps to keep operating costs down.

The packaged system model

Many companies operating within the processing industry choose to go with a packaged system model. In this model, various packaged systems are strung together to create the overall gas processing solution. There are multiple technical issues with this approach that can lead to increased costs from both a capital and an operational standpoint. First of all, the system by system approach tends to provide a facility that has poor integration from one packaged system to the next. This lack of integration, or poor quality of integration, can lead to equipment damage, voiding of

warranties and guarantees, or even missing the processing objectives all together. The cause can be as simple as varying gas conditions from one system to another, or one of the package systems not meeting the operational requirements and therefore throwing the entire system off specification. Should a change in the gas condition, outside of the design basis of the downstream system, still manage to operate outside of the design parameters, the mismatch will still inevitably lead to poor operation and reduced efficiency of the overall facility. The packaged system model will result in reduced plant efficiency and performance as each system will not be optimised for the overall processing solution.

One common problem with the packaged system model is the potential for the presence of multiple utility systems, complicating the facility operations. A well integrated facility can combine many of these utility systems. Having redundant systems can be costly and will add to facility operational issues and increased maintenance, thereby reducing facility online time. The most typical situation is with respect to heating requirements in a cryogenic gas processing facility. With the packaged system model, the operator may receive a separate heater or heat media system with each process system purchased. That can lead to as many as six separate heaters, all required for the operation of the facility. In many cases, the facility heat requirements could have easily been handled with two separate heat systems. First, a common heat media system should be used for the cryo trim, amine reboiler, TEG and inlet systems. A separate direct-fired heater may be required for the regeneration of the mole sieve system; however, in many cases even that can be integrated into the common heat media system.

From a commercial perspective, the operator can also have issues with the packaged system model. With this model, it can be difficult and expensive to involve the system packager with the installation, startup or operation of a system once it has been received by the operator. These systems typically must be paid for in full prior to shipment from the manufacturer. While the operator does maintain guarantees and warranties, the vendor has already been paid 100% of the cost of the system, leaving the operator with little leverage. In addition, these systems are typically a standard design that does not lend much flexibility to the operator or even much 'how to' from the original equipment manufacturer as to adapting for a specific scenario. This can lead to more costs and time required to make the facility function for the operator's specific conditions. In some cases, critical information may not even be available for the operator. In addition, purchasing systems from multiple vendors will lead to a facility with valves, instrumentation, electrical gear and other equipment all from multiple manufacturers resulting in operational headaches that could have been avoided with a more coherent overall facility design.

EPC contractors


Many of the issues with the packaged system model, both operational and commercial, can be mitigated by a full EPC contractor that maintains a quality engineering staff

with working knowledge of the systems involved and of all operational requirements for the overall facility. With that expertise, the full EPC contractor can assist the operator with the purchase of these packaged systems and can ensure that each of the systems will meet the operator's needs. A qualified full EPC contractor should also be able to engineer, design and construct an overall processing facility without using standard or off the shelf systems, allowing for a potential increase in plant efficiency and performance should the operator be amenable to vacating the packaged system model for the overall facility. Ostensibly, in order to receive the greatest overall benefit for the project, it is important to involve the EPC contractor in the processing solution as early as possible.

From a construction perspective, a full EPC contractor can offer some significant advantages over separate engineering and construction contract arrangements. Field construction is the single most costly portion of the majority of processing facilities. For this reason, it is vital to control the costs associated with construction. As previously mentioned, a full EPC contractor can offer a true design/build contract structure with all three facets – engineering, procurement and construction – under the same corporate umbrella. This streamlines the project schedule, thereby reducing total project costs and increasing the operator's return as product is available to market as early as possible.

In addition, selecting a full EPC contractor provides additional advantages for the operator in negotiating better pricing from suppliers. A full EPC contractor provides buying power that may lead to reduced costs. A full EPC contractor also helps facilitate on time delivery of equipment, which will keep the overall project on schedule. The full EPC contractor has the experienced staff required to expedite the equipment and, in general, control the deliverables. Expediting of contract deliverables is a critical function in the execution of the project and must be closely managed in order to maintain the project schedule and to keep ahead of the onsite contractor. Delays can be very costly in terms of construction, but there are also substantial issues and additional costs associated with a delayed startup.

Conclusion

There are many ways to build a company operating within the processing industry, but the most effective from a time, quality and cost perspective is to contract a full service EPC company to handle gas processing projects. By spearheading each project from day one, the EPC contractor has the opportunity to control all phases of the job ensuring that the project will meet or exceed the operator's needs. Each phase of the gas processing solution, from engineering through construction, brings value to the project, but it is the opportunity to exploit the synergies of each step through a full EPC contractor that provides the operator with the maximum benefit. 

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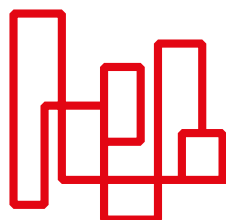
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