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Reeling in Cost Overruns

Carly Leonida | September 12, 2017

Significant cost overruns and start up delays have somehow become ‘acceptable’ in recent years. Carly Leonida looks at different project delivery models and how they could help to address the issue. Cost overruns in the mining industry have been studied extensively. Despite numerous research projects being conducted to find correlations with root causes, the problem continues and is now being described by some as ‘endemic’ and ‘significant’.

Recent studies suggest that these cost overruns could even be in the range of 40-62%. And with numbers like this, when commissioning and ramp up schedules drag out, they have the potential to significantly impact on the overall net present value (NPV) of a project.

To determine the scale of the problem and identify some potential solutions, I caught up with Michael Woloschuk, FLSmidth’s global director for gold, in August.

“This is a topic that’s been discussed for almost 50 years,” Woloschuk told me. “If you look through the forensics, there is a lot of conflicting information. A recent study conducted in 2014 found that there was no association with capital costs overruns as a function of size of the project, size of the company, where the project was located, how the ore was processed etc. And, what a lot of studies found is that mega projects are more at risk to be blown out in terms of capital.”

Woloschuk believes that a change in delivery model could be the answer to many miners’ woes. The engineering, procurement, construction management (EPCM) model-a reimbursable type contract- is, and has been, the industry standard when it comes to building new mines for a long time. However, over the past 10 years, large processing OEMs such as FLSmidth, Metso and Outotec have expanded their offerings significantly, acquiring and developing key technologies in order to offer mines a complete flow sheet. This, combined with in-house engineering expertise, has allowed these companies to offer a full concentrator delivery service themselves.

“Some years ago it wasn’t possible to go to a technology supplier to get an entire flow sheet; you just couldn’t get a seat at the table with an owner if you only supplied a mill or some pumps,” Woloschuk explains. “But when you start putting all of these things together, what we’re seeing is some owners saying: ‘you guys supply us all the technologies, is it possible for you to fit them together too?’ They’re questioning the value of the traditional delivery model.

“EPCM firms earn money by doing engineering, and more hours spent on project management are a benefit to them, but it may not necessarily be of benefit to the owner. “Customers are starting to recognise that companies like us can provide an entire flow sheet and performance guarantees for the full plant, without the owner being caught in the interfaces between the suppliers.

“In these cases, they want us to engineer the processing plant, particularly for gold, and for us to subcontract engineering firms to do the non-proprietary engineering around the flow sheet.”

Put simply, it is usually more difficult to put together and ramp up a concentrator to full capacity with a flow sheet comprising technologies from multiple vendors which are then strung together by a third-party management firm, than it is for one company to provide the whole lot from start to finish.

“What we’re seeing now in gold is that the go-to delivery model is EPC [engineering, procurement, management] which is fixed price, and then engineering companies are taking on risks for capital. But that’s not necessarily a good delivery model for the owner, because there is a tendency to substitute good technologies for cheaper, less effective technologies, and you end up with a plant that isn’t so robust. That makes it difficult to hit production targets,” says Woloschuk.

“The expectation that you can pull capital out of projects and not affect production, ramp up and your revenue stream is something miners are overlooking.”

Looking at the number of gold projects that are going to be built globally over the next three years, two thirds of these will have less than 10,000t/y throughput; small fry compared to a base metal concentrator, say copper, which will process around 200,000t/y. These projects are likely to be high-grade underground operations, with many located in areas such as West Africa, South America and some in remote locations like in the Yukon in Canada. And the engineering for many of these projects is being delivered by small-medium sized Australia-based engineering firms.

Woloschuk says: “We’re hearing from owners that they like the Australian engineering model – I call it no-nonsense engineering! But if you talk to many of the biggest engineering companies, they’re not interested in gold because these plants are quite small [they’re only interested in base metals], so there is a niche for DRA, Ausenco and the likes to be doing a lot of work in this space.”

A sensitive subject

There may be plenty of work available, but the topic of new delivery models, across all geographies and commodities, has been on the table for some time, and it is a contentious one.

On one hand, there are the engineering firms which have dominated this space, almost exclusively, for well over 50 years and have developed and refined the EPCM model as we know it. While on the other are the OEMs which are still relatively new to the engineering space and, while now able to offer mines an alternative build option, are still largely dependent upon engineering firms for the bulk of their equipment orders.
As the old saying goes, you don’t bite the hand that feeds you.

“I think engineering firms are wary of this [new delivery model], because the pulp and paper industry went through the same scenario a number of years ago,” Woloschuk explains. “If you look at pulp and paper or the cement industry now, the bulk of the engineering work for those plants is done by vendors. I think we’re going to see mining head in that direction; it’s just starting to go that way. And I think people are going to question the need to have engineering-led projects when they can go to a technology supplier and get an entire flow sheet.”

That said, Woloschuk is clear that FLSmidth is not looking to compete directly with EPCMs. “We would prefer to partner with them and we think there’s a role for both of us,” he says.

“It’s no secret, if you look at our public disclosure documents the vast majority of our revenue and profits come from selling parts and services, we don’t make that much money on that capital side. Our model is that we need to sell the equipment in order to sell parts, and we don’t necessarily have to do the engineering to do that. We’re happy to partner with an engineer and allow them to do engineering, but they certainly see us as a serious competitor.”

Indeed, competition is fierce, and MM has heard tales from other sources of engineering firms refusing to buy processing equipment simply because they feel the OEM is a competitor.

“Our business is to bring value to miners, and it’s up to them to determine which model offers the best value for their project,” Woloschuk says. “It’s been four or five years since FLSmidth announced that it was going to do engineering [as well as equipment], and that was at the height of the boom when all the EPCMs were full and you were lucky to get a D-team in. Good people weren’t available, so the technology suppliers stepped in and said ‘we can help you with engineering as well’ and I think now there’s a different message out there.”

He continues: “Often we’re approached by owners and we’ve said to engineering firms ‘we won’t compete with you, you are our customer’, but where an owner approaches us to say they want a vendor-led model then we’re going to pursue that, because our competitors [Outotec and Metso] are going to do projects that way.

“The message we’re trying to get out there is the advantage of putting together a flow sheet with components and engineering from a single technology supplier, because it significantly simplifies execution. By doing the material testing early by the technology supplier, the flow sheet can be optimised. In the EPCM model the individual process steps are kept generic to allow for supplier options.

“Once these projects are built, engineering firms are off onto the next job, but we can be there for the life of the plant, so the more equipment that we have in there, the more incentives we can offer owners with respect to services and parts for the life of the mine.”

Kick starting change

The question is: what will it take to change the industry mindset and raise awareness of the different delivery options available?

“I think we need mining executives to focus more on cash flow. There’s a lot of talk about total profit ownership, but even the majors aren’t doing it,” Woloschuk says. “We had one example where our technology was better for the project NPV, but the engineering firm took a lower cost alternative with upfront capital because their project director’s bonus was dependent on achieving the capital cost budget. Their mindset was that once they handed the technology over to operations, it was somebody else’s problem. There wasn’t a focus on the operating costs like they might indicate.

“There is a lot of that within mining companies; there is such a huge focus on pre-production capital that people are losing sight of the implications – they’re pulling out the back up equipment for instance, the spare pumps that are no longer in the flow sheet, because they’re trying to save capital and of course when the pump goes down, so does the entire plant. There’s not a focus on the revenue stream, on operational costs, keeping the plant maintained and high availabilities.”

He continues: If you look at the actual cost of the mechanical equipment and the technologies, typically the mechanical equipment might be one third of the process plant costs and the process

plant again might be one third of the total costs when you take into account mine development and equipment, infrastructure all the rest of it. So you're talking a small fraction of the overall plant is technologies, but that's really the heart of where the revenue stream is.

"If you aren't meeting production and you're taking too much out of the process plant, you're putting your project at risk and we are seeing that. There are examples right now where a single asset company has gone to a new technology, and there's been a lot of whispering in the industry 'is this really going to work?' and they're struggling. They're having all kinds of problems in the process plant, so there are concrete examples out there that people are perhaps focused on the wrong metrics."

Do your homework

Woloschuk's advice to miners is simple: shop around and do your homework.

"My advice is look at the best delivery approach for your project," he says. "Challenge the conventional way that these projects are being delivered, because there have been a lot of failures. Approaching a vendor, getting them engaged early to help you understand the flow sheet and the variability that the mine might see, could make a big difference. We can work alongside the engineers to give owners the best solutions for their plant, and that takes out a lot of risk."

He continues: "With gold, a lot of the miners out there are junior or mid-tier companies with single assets or a couple of assets in their portfolio, and there is not necessarily an understanding among management that there is this new model out there. They're used to seeing engineering-led projects, and I think there's a correlation between those delivery models and the reason that these projects are blowing out, so perhaps it is time for a shift in the industry."

What kind of cost savings are we talking about here? Woloschuk is understandably coy given the scant number of case studies made publicly available to date: "If you look at the procurement package for a processing plant, there's potential that 50% of the value in that package can come from a single vendor, if not more," he says. "If you can put that dollar value into one company, what you're doing is creating a single point of contact for most of the technology in the flow sheet, so it simplifies the project management component – fewer interfaces.

"Chopping up of the flow sheet creates a lot more time in terms of going back and forth, confirming design and vendor information and defining the detailed engineering. Early vendor engagement for bigger parts of the plant, have shown great opportunities in other industries through value engineering in the concept stage.

"You can compress the schedule of engineering significantly if that's all brought into one place, so to quantify that at this stage, I think we probably need a few more examples of how this is being executed. We announced in February that we were awarded phase one for Belo Sun's Volta Grande gold project in Brazil. That is vendor led and we're subbing the engineering. That's going to be a good example of how we can improve on the old delivery model.

"We're actively bidding for several other projects with complete gold flow sheets as well. There isn't a lot of history there, but I think time will tell that this model is indeed more competitive versus what miners are doing now."

Of course, convincing mining executives is only half the battle; shareholders are unlikely to give a project the go-ahead if the risk involved is significant. A 2017 report by EY titled 'Opportunities to enhance capital productivity' stated that two thirds of mining projects now run

over budget and, on average, they cost 62% more by the time they're built versus when budgeted.

No project can take that kind of hit on capital; shareholders will not tolerate such a large drop in value and, if changing execution models could potentially remove some of that risk, then it is worth looking at all the options available.

"Mining companies are slowly starting to see the benefit of new delivery models," Woloschuk says. "A lot of these are run by executives who have been in senior roles within engineering firms, and they're questioning the value of these models and saying to us 'you have the heart of the equipment in our flow sheet – I want you guys to take on the risk for process warranties'. And we're happy to do that.

"Our message for the junior and mid-tiers out there is if you're hinging the life or death of your company on a single asset and you're taking on debt, you want some certainty in production and wrap up. And I think the best way to do that is by approaching someone like us."