

The Engineering Procurement Construction Industry

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Introduction

The world we inhabit finds itself at the junction of an exceptional coincidence of events:

- World GDP has experienced a period of rapid growth since 2002, notably in 2004.
- Oil prices have breached their previous absolute highs on several occasions.
- Gas prices in both Europe and the USA are 'reaching for the sky'.
- For the first time for decades there is a shortage of refinery capacity for transport fuels

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Not surprisingly, this 'perfect storm' has provoked exceptional capital investment plans in the oil, gas, refining and LNG sectors, with many of the national oil companies and the independent oil companies revealing investment plans higher than in recent years.

The world has seen surges in oil price before but this time things are different:

- The surge is driven primarily by a robust growth in demand.
- World economies are mostly healthy and more resistant to higher oil prices than heretofore.
- It will take time to design and install the plant and equipment to rectify the supply shortcomings.

It is the latter of these that represents the single greatest threat to the increased demand for energy being met without further spikes in price. Supply shortcomings are evident throughout the supply chain, through shortage of

drilling capability, shortage of commodity materials, shortage of critical equipment and, most importantly, the shortage of human capital to define, manage and implement the many and varied complex projects currently planned.

We can conclude from this that constraints on the supply side will continue to dominate the markets for several years and that there will be tremendous incentives for those companies who can most effectively surmount the supply bottlenecks. In this article we look at the world as seen through the eyes of an Engineering Procurement Construction (EPC) Contractor and provide some pointers to initiatives which are, or which can be, taken to ensure that the supply side responds to the rapid growth in demand as fast and effectively as it is able.

The Problem

Not surprisingly the response to the surge in energy prices has been a surge in capital investment plans. The National Oil Companies of Saudi Arabia, Kuwait and Qatar are all implementing well-known and very large project portfolios. The 'easy oil' is mostly in the hands of the NOCs. The International Oil Companies (IOCs) are being pushed towards new technical frontiers, in deep water, in arctic conditions and in areas with high political or country risk. Between them, the NOCs and IOCs are calling upon a large volume of capable EPC expertise, and both volume and quality of human capital, in order to overcome the technical risks associated with new frontier oil. Much technical expertise has left the oil companies in the last decade or so, as many of them consciously reduced their engineering capability. The contracting companies are now the main source of that support.

Nor, however, is the contracting industry currently either fit or healthy.

It is at the end of a long period of relative famine and contraction; it has a large number of players, and is fiercely competitive. As recently as 2003 the net earnings of the world's largest ten E&C companies were negative and in the ten-year period to 2003 they have fallen in both real and absolute terms. Contrast this with the ten largest oil companies who have seen a threefold growth in earnings in the same ten-year period. The contracting industry is like a retired and battered 75-year old who is being asked to run a marathon.

The Consequence

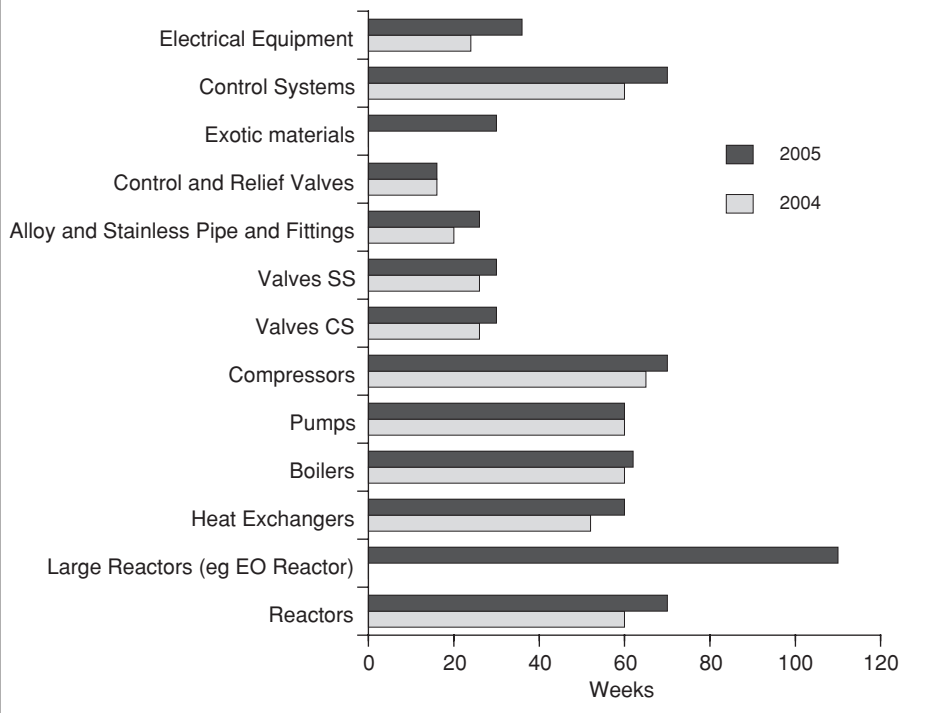
The consequence of a continued imbalance of demand and supply; and of a large number of owners trying to satiate a great thirst from a pool which has been growing only slowly is, in the first place, obvious...inflation. The second order effects are maybe less obvious.

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Inflation comes in two forms: Cost inflation and time inflation. The industry has already been experiencing the impact of cost inflation with the surge in commodity prices from steel, through cement, aluminium and so on.

With cost inflation comes time, or schedule, inflation as vendor fabrication shops fill and they too scramble for access to the raw materials and human capital they need to deliver their goods. Figures 1 and 2 show the growth that we have seen in delivery times and prices for a range of equipment in the last year.

Figure 1: Delivery Lead Times



For the EPC contractor the consequences are complex. The execution of a large EPC project requires the coordination of thousands of activities, the specification, procurement and installation of tens of thousands of equipment items, parts and components. While the construction industry is in boom, the EPC contractor, paradoxically, finds himself in a period of high risk. Rapid inflation in some commodity and materials prices cannot be accurately forecast; despite the most complex and proven project management tools, there are still a multitude of reasons why a project can be delayed and for which our historical risk norms and experience do not equip us. This is an environment in which it is all too easy either to become rich or to go bankrupt. If this is a dangerous environment for the contractor it is more so for the project owner or financier whose downside and upside are both that bit larger.

As we sail into new waters, it is clearly appropriate that we re-examine some of our historically proven methods for the management of projects.

The Solutions

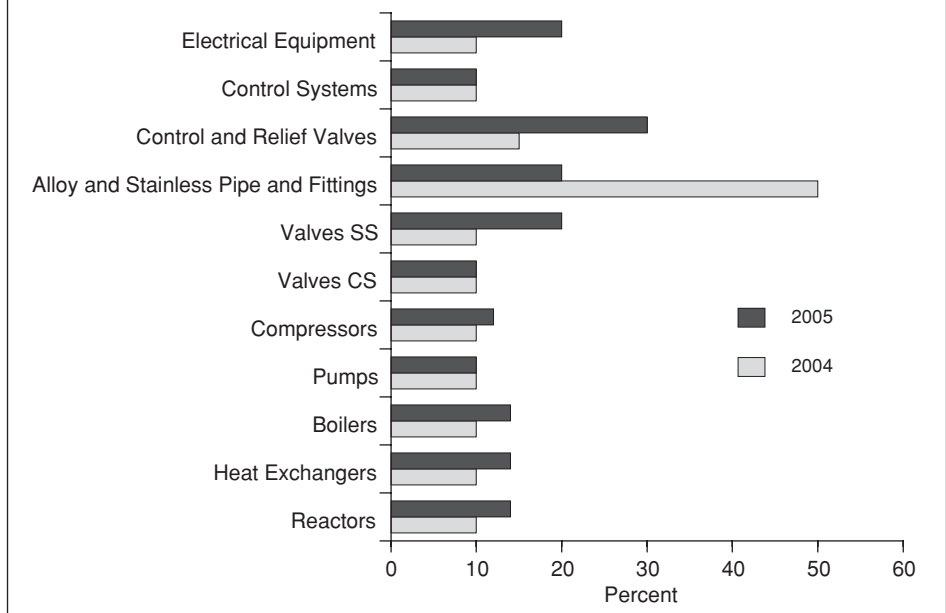
The reader should note the plurality of the heading above. There is in fact no single solution, nor even a combination of solutions, that will totally alleviate the problem. Prices have, and will continue, to rise; project schedules have, and will continue, to grow. This is likely to persist for the

next four to five years unless some unforeseen event acts to reduce demand. There are, however, a number of actions that we have seen and have initiated which we think will reduce the impact and reduce the risk.

Contracting strategies are changing. Many companies are now looking at contracting strategies which distribute the share of risk more equitably and which provide a carrot for good performance as well as a stick for poor performance. An industry where EPC contracts have been dominated by Lump Sum Turnkey (LSTK) contracts is now seeing the wide application of:

- EPC contracts where a reimbursable contract is converted to LSTK through open book conversion. This gives the investors the ultimate insurance of end cost and schedule before the final investment decision is made and also ensures that the contractor has sufficient time to manage his own risk, thus widening the potential market of bidders.
- Reimbursable contracts with performance incentive. These contracts obviously place more risk with the owner but in turn ensure that both owner and contractor objectives are aligned and provide the owner with a wider number of potential

Figure 2: Price Escalation



contractors with the ability and the appetite to bid.

This development has further to run, both in extending a trend towards client/contractor alliance or partnership and encouraging a larger number of clients to participate.

The increased risk requires a better management of the supply chain. This can take many forms, from an increase in quantity and focus of managing timetables or through partnering with suppliers to understand and upgrade their capabilities. Initiatives of this kind, however, are ultimately directed towards improving the contractor's competitive situation.

More important than management of the supply chain is the growth in supply capacity. One important element of the supply chain management is the development of fabrication and construction capability, the so called 'local content'. There has long been an appetite in the project host countries to expand local capability; there is now an imperative that this be met. A contractor with a global reputation is able to exploit its local presence and global procurement capability both to identify new and local suppliers and contractors and to work with them to expand and develop their capability.

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One initiative in which we can claim success is in moving the construction to the labour pool as opposed to the conventional and opposite approach of moving the labour to the construction site. One interesting and current phenomenon is the number of large complex projects which are being built in economies already booming but where the construction labour and supply market has not been well developed. The Middle East is particularly active, but so too are Australasia

and the Asia Pacific countries. For obvious reasons it is those countries with labour resources that are seeing the greatest growth, while conversely the oil-importing countries are negatively impacted. The latter are seeing pressure on their economies, downward pressure on salaries and upwards pressure on unemployment. Through the use of onshore modularisation – of the type very familiar to offshore industry – we have been able to move significant quantities of work from areas of labour shortage to areas of labour availability. We have seen that this can have benefits on cost – due to the saving in labour costs – but has definite advantage in scheduling and schedule guarantees. It allows offshore construction to be decoupled from site preparation and civil works.

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The last, most important and probably most difficult initiative is the increase in human capital. This is a journey that has several steps:

- The first step simply involves hiring. The EPC industry has seen contraction in recent years so in its first phase of growth was able to attract back to the industry those who had left.
- The second step involves a large number of fishermen fishing in the same pool and escalating the price of fish. This ultimately has the effect of rendering previously marginal projects uneconomic.
- The third step involves moving work to people rather than people to work. There are large and capable labour forces in India, China and Russia who, with management and support, are capable of growing their skills and expertise. India is the current favourite for this expansion due to its cost competitiveness, English speaking and relative ease of market entry.

- The fourth step is to widen the pond in which we fish. The recent expansion of the EU and the easier flow of labour across borders have multiplied the number of potential European based companies, with Poland, Romania, Hungary amongst others being a source of capable and mobile engineers and technicians.

All these four steps, however, are basically aimed at the increase of market efficiency. The fifth and final step, the only one with real long-term benefit, and, of course, the hardest to achieve, is to encourage schoolchildren and university students to pursue technical and engineering qualifications. The industry finds itself poorly placed to do this. The oil companies and the engineering contractors in the first world have spent the last two decades in contraction and have offered little scope for recruiting. For example, Chemical Engineering graduates have reduced year on year for over a decade. It will be very hard to reverse the flow and to change the image of the industry. Clearly price signals from the market will have some impact but the market also needs some external encouragement. This is beyond the scope of individual companies and can only be initiated at an industry or government level. There is, however, always the danger that, when and if the new graduates emerge from their educational production line, the oil price will be back to \$10 and the jobs will be in a different industry.

