

**Engineering & Construction**  
“Men behaving badly”:  
how; why & what next

**Tony Williams**  
**Director**

**Building Value Ltd**

the independent strategic advisor to the building materials,  
construction & support services sectors

Euroconstruct  
Dublin  
7 June 2002

## ENGINEERING & CONSTRUCTION (E&C)

### Men behaving badly: how; why; & what next

'Men having badly' is the title of an iconoclastic English situation comedy. The focus is on two male chauvinists who are boorish, dumb and only like drinking beer and watching football. They also treat women with contempt. Clearly, the men's behaviour is exaggerated. However, amid the laughter, there is strong thread of reality and a modicum of pathos.

And so, the title of my talk is deliberately provocative; plus it is an attempt to be humorous. However, it is also true.

In order to support this thesis I have chosen the following share price graphs, which underline the value destruction that has been commonplace in this industry. From the UK, Costain is, most probably, the *cause celebre*, although, currently, Germany's Philipp Holzmann is a contender. Note, reader that you will have had to be at the conference to see these pictures.

However, in terms of a further lesson in value destruction I quote here a study of six UK contractors: AMEC, Gleeson, Alfred McAlpine; John Laing; Taylor Woodrow; and Tilbury Douglas over 13 years from 1985-1998 – with, at least the first five being a boom time in the UK.

During this period these companies saw total funds generated of £5.3 billion (including share issues and assets sales of c£1.8 billion). Pretax profits were 36% of total funds generated, at £1.9 billion. However, over the same period, there was a net cash outflow of £200 million.

This means that there was a total outflow of funds to the tune of £5.5 billion, over a decade and a bit. This comprised:

- 'the net of stocks, debtors, creditors etc' which took £900 million;
- tax £700 million;
- dividends £800 million;
- capex £2.2 billion;
- and investments/other £900 million

Since then, too, John Laing Construction has been sold for £1 plus a cash dowry, while Tilbury Douglas has transferred to the support services sector and changed its name to Interserve. Here, I am indebted to the author of this report, John Messenger, who will be joining Morgan Stanley in the next few weeks.

OK, I know what you are going to say. All these businesses did other things besides construction e.g. housebuilding, property etc. However, the message remains valid given the total funds generated and the fact that for 13 years work there was no net cash flow.

## **Synonyms for Engineering & Construction (E&C)**

I also thought it would be fun to focus on perception of the industry and, here, in this table, I have highlighted synonyms for E&C. These include: create, form, top out plus my personal favourite, in column three, box two: edifice.

However, I have also highlighted a box of alternative synonyms for E&C. These include combatant; ruthless; xenophobic; and my personal favourite, in the middle column, box two: high risk.

## **Modus Operandi**

Moving now to “Modus Operandi”, when it comes to E&C or contracting *per se* "cash is king" or at least it should be (but, as we saw a minute ago this is not always the case). Indeed, in theory, if you are not generating cash you are not generating profit - although it is also possible to generate cash and make no profit on an annual basis; in fact it is also possible to generate cash and make a loss.

There are, of course, a number of (hopefully) temporary exceptions to the cash rule. For example, when there is a large contractual claim. This occurs when work has been completed in excess of the original tender price, a provision has been made and the final account is being negotiated with the client. There could, thus, be a period of cash outflow ahead of settlement; a determining factor here, is the main contractor's arrangements with his suppliers and subcontractors.

## **Ease of entry**

The industry is also burdened with notorious ease of entry. Indeed, while I could not become Fluor Daniel overnight – I could, with a mobile phone and a van, start up in business tomorrow. This exacerbates the degree of competition.

## **Claims and provisions**

Also under Modus Operandi, I have listed claims and provisions. Jobs generally finish late and over budget – and so the contractor makes a claim on his client. Similarly, if this contractual impasse goes beyond a year end, provisions are made against foreseeable losses (of which more later).

## **Negative capital**

It is more normal to work on "negative capital employed". Essentially this is other people's money which the contractor holds in between being paid by the client and paying his suppliers – and on which he earns interest income. These cash balances can run to 15-20% of annual turnover in the good times – but more normally 5-10% (and into "positive capital employed") in poorer trading conditions. It may also be the case that the contracting subsidiary of a larger group can be used as a source of cash for its parent. In these cases there would be an internal borrowing charge, which may or may not be disclosed.

The negative capital employed rule for “pure” contractors, however, is not as true as it once was used to be (note, the reference to “pure contractors” excludes companies which are also involved in real estate development and other capital consuming activities). The tendering process is also now more sophisticated and more expensive; and, of course, you can tender and not win the contract.

In any event profitability is mired in the sub-5% category and, typically, in a 1-3% band. Of course, you cannot generalise – although I have – and there are clear regional and style differences in procurement and, ultimately, profit. It is also true that countries like Holland operate a tacit cartel in E&C, while in the US – the holy grail of Guaranteed Maximum Price (GMP) – is not all its cracked up to be. That is, the price is often not agreed until well into construction of the project; and then the contractor still remains ‘on risk’. Similarly, construction management fees are typically 1% or less !

Compare this with building sector siblings, where the returns are a multiple (i.e. 5-30%) of those earned in contracting (although the demand for capital is commensurate). For example, the cement sector generally operates on an EBIT margin of 20-30%.

### **The risk:reward ratio**

In essence, the risk:reward ratio in E&C is appalling, given the responsibility which a contractor enters into, and what he takes home at the end of the day.

But then contractors are optimists by nature. You will never, for example hear a contractor say: “the glass is half empty”.

It is also the case that a 1-3% margin cannot be budgeted for i.e. on a £10 million or £100 million contract, for example, it is not possible to budget that you will have 1, 2 or 3% left over. If you do, it is an accident. Indeed, the focus for the contractor is contract flaws, which can include additional work (we have all been here, even with our own houses). In other words the contractor makes nothing on the initial estimate of the cost of the job, but makes 20% on the extras.

### **Corruption**

Sadly, it is also the case that corruption remains rife. The bag man – with a suit case (or envelope) full of cash – really does exist in order to ply clients. Similarly, on a major UK job which is being let as we speak, the main contractor informed a small subcontractor that he would be appointed. However, after a sumptuous dinner, the main contractors asked: “what’s in it for me”. Herein, he did not mean for his firm – but for him personally.

### **Inefficiency**

The industry is also inefficient. Contrast, for example, the motor industry where every day an operative turns up for work and knows exactly what he has to: screwing nuts on wheels, for example. However, the average building operative doesn’t have a clue

what he will be doing when he turns up for work – it could be any number of jobs (and I will return to this). My other rule of thumb is anecdotal. Indeed, walk past any building site and spot how many people are doing anything; anything at all. Finally, there is the issue of theft from sites, which is estimated to be running, in the UK, at as much as 5% of total construction output.

## **Accounting**

Accounting in E&C is one of life's mysteries - or as I call it "a black art".

Firstly, turnover and profit in any one year maybe unrelated. Turnover – revenue or sales – is booked as incurred. However, profit can relate to work completed in prior years i.e. it is not coincidental (which makes further mockery of annual margins). Similarly, the relationship between cash flow, profits and turnover is extremely opaque. Nor is there, commonly, a distinction in the sales line between fees (with no external costs) and revenues which are booked simply to recharge subcontractors for material and labour at very low margins. This means that there is no distinction between internal and external expenses – and hence no information on how the relationship with the subcontractors has evolved.

A key element is the declaration of profit. At its most conservative - a contractor takes profit when the job is done, signed off, swept up and the money is in his bank. However, others take profits at certain stages of construction, which are agreed as being complete. Still others take profit on work, which they haven't been paid for (i.e. cashless profits). In theory, this is not possible under international accounting standards but it does go on – and ultimately it is found out.

Take just one example of a major contractor's accounting policies.

### **Profit recognition on contracting activities**

“Profit on individual contracts is taken only when their outcome can be foreseen with reasonable certainty, based on the lower of the percentage margin earned to date and that prudently forecast at completion, taking account of agreed claims. Full provision is made for all known or expected losses on individual contracts, taking a prudent view of future claims income, immediately such losses are foreseen. Profit for the year includes the benefit of claims settled on contracts completed in previous years”.

My case rests.

It is also true that foreseeable losses are provided for (even if the contractor believes there is a very good chance of winning final settlement). This commonly occurs around an accounting year-end although these are not always disclosed (see below). It is also the case that an accounting year is just that – and has no relevance to the life of a contract or project.

In essence, such practice means that even when a job goes well, the bulk of the profit is weighted towards the end of the contract.

## **Margins**

Clearly profitability is a key determinant of success. However, as mentioned earlier, turnover and profit in any one year may not be related i.e. the turnover is current which means it derives from work undertaken on a day-by-day basis; or on an annual basis it is "the value of work executed during the year" (and perhaps including amounts not invoiced). However profit may relate to work completed in a previous year or years. Indeed while the average time span of contracts in the UK is a year or less - many run beyond it.

Secondly, profitability is low - typically in the 1-3% band. For example, I took a random sample of UK contractors and the range of pretax (pre-exceptional/goodwill) margins was 1% to 3.4%.

However, it is important to realise that here these margins are not uniform across the board. Any contractor, will have very profitable contracts (in excess of 10%), average contracts, marginally profitable ones and loss makers.

The implicit demand on a contractor is – stealing a golfing term – “to keep a six off the card”. By this I mean it is all very well playing par or just above for 17 holes – but if you come in with six on the 18<sup>th</sup>, it can mean the difference between feast and famine, if you are a professional. For a contractor “the six on the card” is a loss making contract.

As a salutary lesson, take Japan. The top 25 contractors made a cyclical high return of 4.6% in 1990. This collapsed to 1.7% by 1997, less than 1.5% at the turn of the decade – and now huge losses.

## **Interest received**

E&C is one of the few sectors where the pretax margin can be in excess of the operating margin. That is, when you are essentially working with other people's money, 'interest received' can be a key contributor to profits (albeit that the process of being paid, and paying has been tightened up in recent years).

Then there are provisions against foreseeable losses (as above). When they are sizeable enough they are 'headline' on the way out. However, they tend to creep back in unannounced to annual profit declarations. Note that not all of these provisions are cash (they maybe asset write-downs, for example) and, it is also true, that there is a tendency to over provide i.e. the foreseeable loss maybe £10 million, but why not add in another £5 million for future use – but don't differentiate. There is also a tactical element to provisions. Generally, on a large single job, the contractor will be in dispute with his client. Herein, identifying the scale of provision can weaken the contractor's bargaining position should it be too accurate; thus, making it bigger than it needs to be, in order to help such negotiations.

## **Bonding**

I should also offer a word about bonding. This is a performance bond where a contractor has to lodge cash with the client or an agreed intermediary ahead of

commencing work. It is pretty much like insurance and would be a small percentage (say 1% or 2%) of the job size or maybe the difference between the value of chosen bid and the runner up. This is pretty much *de rigueur* in most international markets but requires committed bank facilities. However, few contractors talk about it. Also, less credit worthy companies – who can't attract bonding capacity – team up with others who are, by way of joint ventures etc. This facilitates the provision of bonding, albeit that the less credit worthy company remains just that – a less credit worthy company hiding behind a more solvent partner.

### **Beware of...**

Interpreting an E&C contractor's accounts is a minefield. However, there are a few warning signs on which it pays to maintain a look out. For example, year end cash tends to be manipulated in order that it peaks at balance sheet dates (the contractor locks his cheque book away for the last six weeks of his fiscal year, or half year). That said, a quick check of interest received will tell you that the cash was not there for the whole year or a given six month period.

Sharp successive rises in turnover can be good news, but they can also be bad. It maybe that the company is over trading. Similarly, it could be sustaining momentum in order to avoid coming clean on profitability.

The movement of debtors can also be significant, particularly if they rise. And, finally, any explanation of poor cash flow is generally suspect.

### **Acquisitions**

When it comes to acquiring contractors there is always the past, the present and the future with which to contend; it is like hitting a moving target. This is not just unsettled claims and the like - but completed contracts, where the contractor may have given guarantees or he is responsible for performance. This is very difficult to track down fully - and clearly has to be reflected in the acquisition price.

### **Past, present and future**

Indeed, 'the past' (i.e. responsibility for historic contracts) may stay with the vendor or be acquired along with 'the present'.

'The present' is essentially work-in-progress. Remember, there should be a profit implicit in the work in progress of a company - the more conservative the company, the greater the implicit profit. However, as mentioned earlier, provisions and claims are excluded from work in progress – and there is generally little disclosure as to how large these provisions are, in total, or in relation to the underlying contract sum. Nor is there, generally, any information provided about whether last year's provisions were adequate.

Above all, there is little disclosure of how much risk the contractor is exposed to at any one time. Externally it is also impossible to calculate whether an increase in margins is due to an increase in risk or a change in the terms of trade with subcontractors, increased efficiency or the settlement of past claims.

## **Future perfect?**

Finally, there is the 'the future', this relates to a contractor's orderbook, and due diligence would take the form of:

- has he done his sums correctly ?
- what commitments has he made in terms of time, cost, resources etc ?
- are his estimates accurate ?
- how long is the orderbook ?

*plus*

- it is advisable to undertake a full analysis of client exposure
- a contract-by-contract review is also recommended

However, at any time when one E&C contractor buys another, the purchaser has to, at some time, close his eyes, take a sharp intake of breath – and do the deal.

Indeed, generally acquisition multiples are derisory, often in the neighbourhood of 20% of total sales value. By way of contrast, a building materials distribution company would be sold at 40-60% of sales and, in exceptional cases, more.

## **Product or region?**

In any event the contractor generally has two choices when it comes to growth by acquisition i.e. to diversify by product/service or geography. This, in turn, is designed to iron out earnings volatility. Furthermore, in terms of geographical growth, buying a contracting business remains, pretty much, the only sensible way to enter a new market. This can take the form of a minority holding, joint venture or acquisition.

Indeed, E&C is a local business, which depends on local understanding and relationships. To enter a new market cold i.e. say a German bidding for the Bangkok ring road - he would either not make the tender list, or if he somehow won the work, he would lose a fortune. Thus, it is advantageous for contractors to invest in or buy a local business - so that they are also perceived as locals and can learn how local markets operate. For example, as many of you know, Hochtief owns minority stakes in Ballast Nedam in Holland and Leighton in Australia – both of which are regarded as Dutch and Aussie companies.

## **A people business**

Herein, it is important to realise that contracting is a people business - normally with very few assets. However, people are mobile. They get up and leave (just like in investment banking). This is another reason why buying a business out-right has to be managed carefully - unless the buyer wants employees to leave or that they do not have alternatives. If not, it is possible to buy a business on Friday and turn up on Monday and find nobody there.

## **Acquisitions**

It is also the case that the industry's low margins encourage mergers and acquisitions, and there has been a creeping rationalisation in recent years. For example, Skanska and



Kaverner; Lend Lease and Bovis; Hochtief and Turner; AMEC and AGRA (having already taken a stake in SPIE) and, most recently Dragados and HBG. Furthermore, Dragados is now part of a three way merger with Aurea and Acesca to form Europe's third largest toll road operator (amongst many other things). E&C rationalisation, however, is still not even close to par with heavy building materials – where six cement companies (“the six sisters”) control 44% of the world's cement capacity (outside China). However, contractors tend to be bridesmaids who end up doing everything a bit later than their friends.

### **Death of the conglomerate**

A further stimulus to industry focus has been the death of the conglomerate. For example, since 1998, Tarmac (principally heavy building materials) demerged its construction unit (now Carillion) and then was itself absorbed by Anglo American; cable giant BICC demerged Balfour Beatty; Vinci was created; and shipping company P&O sold Bovis Construction. Finally late last year, John Laing Construction – a household UK name – was sold for £1 (plus a dowry) to the privately owned O'Rourke; this left the rump of Laing, represented by housebuilding and investments.

### **Procurement**

This trend has been stimulated by the need to specialise. E&C may have been a great cash cow, but it was demanding greater and greater attention, exposed the conglomerate to greater risk and, often, detracted from its rating on the stock market. It is also true that a super league of contractors has developed – slowly but surely. They tend to be large, multi-skilled, multi-disciplined and transnational; so befits the increasing number of large jobs, particularly in infrastructure.

At the other extreme, are the niche players, who offer a smaller scale, specialised service – who are also vital to provision of the built environment.

In between, are the middle-sized boys; too big to be niche and too small to be ‘all things to all men’. And the key risk here is that you get a kicking from above and a nipping at the heels from below; potentially, the worst of both worlds. I call it ‘the medium sized killing fields’.

### **Perception**

As I have shown, the industry is neither profitable enough, *per se*, or capable of generating a quality steam of earnings. Unsurprisingly, investors do not understand it and show little interest in a cure; and E&C is not a ‘must have’ sector. Subsequently, the industry is not highly rated. For example, the historic PER of a basket of leading UK contractors is 13.3x, which compares with the London stock market's 23.4x.

Yet, construction is a vital industry. Where would we be today without this auditorium, electricity plus the roads and airport, which brought many of us here today? Furthermore, with some 10% of European GDP, construction is the region's largest single industry and a major employer. Indeed, it is fair to say that contractors' skills are undervalued by the investment community. Sadly, it also remains a

spectacularly poorly paid industry. For example, a site manager on a major civils job is effectively running a small town and, yet, he earns what a secretary in London takes home

## **Procurement**

In its favour, the industry's style of procurement is changing; and changing for the better. And, this is being driven by both intra and extra mural impetus.

Competitive tender is risky for the contractor (lowest price wins) and unsatisfactory for the client (the lowest price is not always the best or most reliable). When it goes right, competitive tender can be very profitable indeed. However, negotiated work is to be preferred. This is the direct opposite of competitive tendering. It occurs when the contractor and the client sit down and agree a price for the work, which they have agreed to have done/to do; this is particularly true when a client and a contractor develop a relationship over time.

## **Different contract types**

Negotiated work is probably less profitable *per se* than competitive tender - when it goes right - but it is infinitely more certain and secure. There are a number of permutations too - such as management contracting and its various hybrids. This can take the form of the client employing a contractor to supervise the work of all professionals and other contractors. In return he takes an agreed fee (normally a percentage of the job value, say 1-2%); or the contractor will manage the job but actually build it as well. Similarly, the contractor may procure the design of the project by way of a design-and-build contract. Then there is one of the more recent panacea: partnering. Here the client and the contractor work together towards a common goal, with often a gain share/pain share agreement. When it works, it works very well indeed.

In addition to the cost of tendering, the contractor may also be asked to invest money in the job. This may be a pre-requisite of even tendering and certainly of winning a particular contract. In these cases the contractor would expect to, ultimately, earn a return on his equity investment - but this should not be confused with the construction contract, which should stand up in its own right.

## **Client friendly**

So there is some change, some improvement in what has been a traditionally intransigent industry. Indeed, it is becoming more client friendly and more efficient (although there will be a staunch element which will never change). One good example of increased resourcefulness is prefabrication of sections of a building or structure off site. This may be more expensive *per se*, however, it saves time on site, when the various elements are bolted together. I spoke earlier about automobile production, wouldn't it be great if the building operative knew each day exactly what he had to do? For example, bolting wall panels together, installing modular bathrooms etc - rather than his more haphazard role of today.

Indeed, the industry is becoming more sophisticated and the large scale work is polarising to the large firms or consortia. This is particularly true in civil engineering, and especially major infrastructure schemes such as the English Channel Tunnel and the fixed link between Sweden and Denmark.

In the case of a consortium bid, this provides an attractive way to be able to offer a complete range of skills, a fuller cash commitment - and to spread the risk. Another dimension appears when Governments becomes involved by offering “soft financing” along with their domestic contractor’s bid (for example Japan and the second Bosphorous Crossing). Similarly the Brazilian contractors have used army conscript labour.

## **DBFO**

The trend in the industry has also been towards DBFO packages – which means Design/Build/Finance/Operate. This relates particularly to large infrastructure schemes where the contractor undertakes (or commissions) the design, procures the funding, builds the link and then operates it afterwards. This often results in a partnership with a national government whereby private funding is used to build a public sector transport scheme. Thereafter, the funders collect the tolls as revenue for a set period afterwards, typically 25 years – then ownership reverts to the State.

## **Client demand**

In essence, the contractor is becoming more client friendly. He needed to. As a wise man once said participants in the construction industry act as if they are in a boxing match, with each one trying to knock the other over; whereas in reality they should be more like a team of archers all aiming for the same target. Bullseye!

The industry does not yet possess the alacrity of Robin Hood (nor his appropriated social services), but progress is being made. For one thing the jobs are getting bigger, especially infrastructure and fixed links. Similarly, private sector clients are also growing in scale through the rash of mergers and acquisitions over recent years (albeit not so much in 2002). This is particularly true of those clients involved in telecoms, drugs, media etc. In addition, the cost of bidding is rising significantly (with no guarantee of success), which, in turn, encourages an increasing professionalism.

## **PPP**

The vogue in many markets, too, is Public Private Partnerships or the Private Finance Initiative, which serves to attract private capital to fund public sector jobs. This also generally means that the contractor takes a small equity stake and may even procure the total funding package (albeit not on his balance sheet).

Hand in hand with this demand, the contractors have appreciated the benefits of ‘one stop shopping’ – from conception to facilities management. In addition, the sheer scale of the schemes demands more than one contractor, which provides for ‘safety in numbers’.

In terms of Government work, much of this is channelled into PPP, as ruling parties everywhere seek to sustain lower budget deficits. In fact, they pass on the capital commitment to the private sector and they pay for it (e.g. road usage etc) out of revenue expenditure. In the process, however, they have become increasingly hard nosed. The same is true of newly privatised utilities and other public sector bodies. For example, take the UK railways – as you will all know they are in a terrible state and the industry's recent safety record is tragic. In any event, the former CEO of the now insolvent Railtrack said that he saw no reason why rail maintenance should attract more than the normal contractors' margin of 1%.

Indeed, clients are no angels. For example, everyone is an expert on building and construction and we all have personal stories of how badly a job went. Similarly, most people love to beat up on a contractor. However, such is the parsimony of profit margins (say 1-3%), a modest concession, on the part of the client, would win immodest co-operation from the builder.

### **Solutions**

Bluntly, there are too many E&C contractors. So halve their numbers, assume the same turnover and the sector would double in value.

Clearly, this is not as easy to do as it is to say.

On a more practical basis, is the pursuit of reduced volatility ('the holy grail'). This can be achieved through diversification by offering, a transnational push, a greater proportion of fee based revenues and, last but not least, risk management (of which, more anon).

### **Capital adequacy**

My third solution focuses on the perception/valuation conundrum. Why not value a contractor on a capital adequacy basis. In fact, this was first discussed by Simon Goodfellow (a friend and former colleague) of ING Barings in a seminal note entitled a 'Path out of the Woods'.

In any event, capital adequacy is a tool employed by the banking industry, which relates loans to shareholders funds. Furthermore, the loans are risk weighted. For example, corporate loans are 100% weighted, while OECD financial institutions are at 20% and sovereign state risk at 0%. Essentially, it is measuring both the zeal, or otherwise, that a bank has in pursuing business - and what can and would be paid out in an emergency. Being a bank, however, loans are also regarded as assets.

By example, say a bank had shareholders funds of £100m and loans of £1 billion, its capital adequacy is 10%. Happily this is inside the minimum standard of 8% set by the Bank for International Settlement in Basel in Switzerland.

It is difficult to show how a contractor obtains a return on capital employed – given he is working (or should be) on negative capital employed. However, in many ways the contractor is similar to a bank, which makes a large part of its return in assuming contractual obligations and holding cash balances built up during the period before

that obligation is finally discharged. It also operates on negative capital employed and can only be measured by its return on equity.

### **Key concept**

Capital adequacy is the relationship between shareholders' funds and the company's total commitments. In the case of a contractor, the asset base could include all the normal items such as plant and work-in-progress plus a new category called "orders in hands". These would be stated net of cash received and work performed. At present the first time a contract appears in the accounts of a company is when the monthly cash flow starts. Gradually, the contract turns into work-in-progress and then into contract debtors and turnover.

On the other side of the balance sheet are contract obligations – the contract value of all bridges, roads and offices that the firm has undertaken to deliver. These are stated net of invoiced sales but include a separate line for provisions (i.e. not netting them off work-in-progress).

By way of example, say a contractor had shareholders' funds of £100 million (including "orders in hand") and contract obligations (or 'contract-related assets') of £1 billion – its capital adequacy ratio would be 10%.

### **Focus on turnover**

That said, order book details are not always forthcoming. So, as a proxy I have plumped for annual turnover. This broadly represents contract obligations. In the same sum as above £100m plays, this time, £800 million of turnover, which produces capital adequacy of 12.5%. However, orders are generally well in excess of annual turnover, which would dilute the latter percentage further. In any event, taking the calculation as read, and picking a sample of UK contractors, the average capital adequacy was 7.5% in a band from 5.5% to 8.8%.

Such a valuation tool does not answer every problem, but it is a start. In particular it could identify those contractors, which are over trading. Furthermore, E&C companies should be looked at more as quasi bonds or utilities – rather than valued on a PER basis (which hasn't done them any favours). It is also the case that fiscal year ends are totally artificial for the busy contractor.

### **Risk management (RM)**

Returning now to performance, rather than valuation, I have highlighted a number of factors which are/will act as 'drivers of change'. Herein, a fundamental change has been the rise of corporate governance, which is the touchstone of best practice. In the UK, this has been led by the London Stock Exchange and the Financial Services Authority, in general, and by two major studies, Cadbury and Turnbull. The latter's work culminated in the Combined Code for Corporate Governance – which encompasses risk management - and which has attracted widespread support and application

The E&C industry's operational performance has also been measured and none of these reports makes happy reading. For example, the Agile Report (1998) in the UK showed that two thirds of projects run over budget and three-quarters are late; there are two or three deaths per week on UK construction sites. Similarly, Sir John Egan's "Rethinking construction" (1998) stressed that the "industry needs a total new approach to delivery the construction product".

Elsewhere, insurance costs have been rising, post September 11. What's more, it is not atypical for insurance to cost 6-9% of EBIT, with a split broadly down the middle between actual premiums and self insurance. However, a major insurance broker has put his clients on standby to expect renewals priced between 20% and 200%. Even a small building company (turnover £130m) has been told to expect a 50% hike.

### **Self help**

E&C is, by definition, a risk business. However, risk management is a potential key to success; and risk management in construction is no longer an oxymoron.

### **Synonyms of risk and manage**

In the same way that I talked about synonyms of engineering and construction, I have also picked some for risk and manage, and these are shown in two boxes. For risk, synonyms include: endanger; jeopardy; threat; and hazard - which is probably the most accurate.

Synonyms for manage include: administer; direct; and organise. However, my personal favourite is 'contrive'.

### **Definitions of risk**

In terms of definition, risk means chance of injury or loss due to uncertain danger, peril or hazard. Taking this a step further, a particular decision or course of action is said to be subject to risk when there is a range of possible outcomes – then objectively known probabilities can be attached to these outcomes. It should, thus, be distinguished from uncertainty, where there is a plurality of outcomes where objective probabilities cannot be assigned. Thus, many situations, which in practice are called 'risky' are, on a strict definition, really subject to uncertainty not risk.

Turning to risk management, the text book definition involves anticipating and/or identifying potential risks and taking steps to avoid them or mitigating the resulting harm. In other words, the aim is to minimise the sum of: retained losses; insurance or other risk transfers; and loss control expenses.

However, I would also highlight a major E&C company's definition of risk: "risk is an uncertain event, feature, activity or situation that can have a positive or negative effect on an object". Clearly "this encompasses both the upside and downside of risk". Thus, "risk management is a formal process that identifies, assesses, plans and manages risk".

## **Why risk management?**

But why have it in E&C? Every company has its own play on words – and I have chosen a selection. For example: “...managing uncertainty in order to maximise opportunity and deliver maximum value”; “to help maximise business value by doing it right the first time”; and the quality of risk management is a “key issue and performance driver”.

In more detail: the group “assesses and manages risk to ensure that:

- the public, our employees and the environment are safe from potential hazards in our operations;
- that new essential assets are created to the maximum obtainable benefit of their intended users and the community at large;
- the potential for damage to our clients and the Group’s corporate reputation and/or financial loss to our stakeholders is minimised”.

## **Risk management versus insurance management**

It is also important not to confuse risk management with insurance management. For example, underwriting focuses on the past e.g. historic losses, litigation, court decisions etc. In essence the design of insurance is empirically based. Or putting it another way, insurance takes a ‘rear view mirror’ to predict/manage the future. This means that the ‘risk puzzle’ goes unidentified and mis-measured i.e. insurance buyers need to move to risk management.

Putting it more simply, as the slide shows, risk management is dynamic, protection orientated and creative; whereas insurance management is passive, security orientated and reactive.

## **Types of risk**

E&C is essential, but by its nature it is also intrusive in the environment and it is often dangerous. Clearly the management of all health, safety and environmental risks is critical – and it is often a pre-condition of winning a contract. Indeed, this is particularly true in power and energy industries – and especially the nuclear and oil and gas sub-sectors. In addition, there are labour risks, transport risks and so on – in fact every project or activity faces the full spectrum of risk.

However in broad terms, they can be divided into four categories: strategic; operating; financial; and information.

In the strategic risk category, there are two sub-sectors: environmental and organisational. The first would include, for example, natural and man made disasters plus regulations; while the second would comprise corporate objectives and strategies, human resources and management. Operating risks pretty much speak for themselves, and would include issues relating to the workforce, suppliers, plant and machinery. Financial risks are tied up with performance, funding and the regulatory environment, while, finally, the risk of failure in information flow can be 100% critical to a successful job.

There are two stages to risk management. Firstly the management process i.e. identification, evaluation, implementation; followed by control i.e. avoidance, prevention, reduction, transfer.

### **An E&C case study in risk management**

All that theory, is of course, as dry as a chip. Thus I have picked a major E&C company, based in the UK, which, I believe has a blue riband risk management system.

Of course, every E&C company knows about the principal of risk. This company was no exception, although historically there was no single or formal approach to risk management. Some work on risk was carried out under a health and safety banner, and also within internal audit. However, the ‘risk manager’, if he existed at all was purely an insurance manager. Sure, part of the solution is insurance, claims etc. However, some things cannot be insured and it is vital to have proactive risk management.

Not surprisingly, the catalyst to change can spring from a job that goes wrong and this company was no exception. It experienced a major – and very public – contract failure, and this was the spark.

### **Analysis and implementation**

Firstly, an audit of risk assessment was undertaken, with pretty disparate results. However, extra-mural best practice was also benchmarked. Latterly, there was external impetus in the form of regulatory commissions, for example Cadbury and Turnbull. However, three years ago the company employed external consultants. Herein, it chose AEA Technology, formerly part of the Atomic Energy Association, but by then independent; and what they didn’t know about risk management, given their industry, wasn’t worth knowing. In addition, the company’s insurance broker was also brought into the loop.

However, it is all very well having the theory; implementation is just as important. For this the company signed up two leading academics, who were leaders in their fields and both professors at the University of Leeds: Steven Male (value management) and Nigel Smith (risk management). Subsequently, representatives from each major business unit were appointed as ‘champions’ in the risk management process – so that it was not just a ‘top down’ initiative.

### **Software**

Some 18 months in the process, an externally designed software package was rolled out; and now a further 18 months on version two has been launched. This time the company had a lot more input to the design and Mark II is reckoned to be “one of the better construction based packages”. It is also believed that it will afford “a marketing edge”.



Any system, of course, has to be flexible. For example, this major E&C contractor is currently working on some 1000 sites with in excess of 25,000 employees. However the application of any risk management process must be homogeneous: “one size fits all”. Subsequently, a concise ‘Group framework for Risk Management’ now exists including ‘Uniform Risk Assessment’.

### **Consensus and application**

Of course, you have to train people to use it and, herein, it is important to achieve consensus: “everyone has to be behind risk review”. In addition, risk management needs to be applied to very stage of a bid: initial identification; pre-qualification; design; pricing; on site practice; and – if you are to manage the completed facility – living with it for 25 years or so.

### **Knowledge is the key**

The key to truly successful risk management, however, is knowledge and maximisation of information flow through the life of the project. It is also important to record what courses of action were rejected (and why). Indeed, once the contractor is on site, previously rejected ideas may be (re) reconsidered. It is, thus, vital to record why they were shelved. Indeed, when a new, similar project is planned, an empirical history of analysis and action exists i.e. a working register.

### **Risk grading**

And so after some three years, risk management is used almost everywhere in the company; and all major contracts are required to use it; and this includes generic risk assessment. However, best of all, the risk can be quantified with a ‘Risk Grading Tool’ via a 10-15 minute electronic menu. This encompasses a number of formal stages involving the identification, definition and assessment of:

- business or project objectives
- relevant risks according to nature, causes or sources and consequences
- likelihood.

Key headings of risk analysis are also employed (which comprise some 80 separate risks): client; contractual; resource; design; regulations; financial/commercial; scope of work/location/technical difficulty; and compliance i.e. health & safety, legal etc.

### **Colour and numeric coding**

The output is a matrix on which all principal risks are plotted. Imagine, if you will, a printed grid, where the ‘Y’ axis registers consequences and the ‘X’ caters for likelihood. The matrix is colour coded like a rainbow:

- the extreme top right is Red (i.e. “no”);
- the top right quadrant is Orange, which can commence with appropriate authorisation;
- the middle is Yellow, which is OK and appropriate arrangements already exist or will be developed at the relevant stage
- the bottom left quadrant/extreme bottom left is Green (“Yes”), where appropriate, normal monitoring and review procedures are in place.

A total numerical score is also calculated plus individual category risks score between 1 and 5. If the total score is less than 25 and, there is no individual risk greater than 5, the risk is low and the project is a 'go'. Conversely, if the total score is 25%+ (say, 5 risks classed as 5), the contract is rejected.

### **Mitigation of risk.**

However, it is also possible to ameliorate or mitigate risk. For example, avoid risk altogether by not taking the job. Alternatively steps could be taken to reduce the opportunity for risk to occur or to reduce the impact of risk, if it does occur; i.e. example, changes to design.

Indeed, all risk needs to be identified but the company also needs to win work – and this is the essence, the *raison d'être*, of employing risk management. It is also vital that once a risk has been converted into a value, “do not lose sight of what is behind it”. By this I mean, that the focus must be on the risk and its cause, not simply the financial impact.

### **Conclusion**

We cannot do without Engineering and Construction. However, it needs to change – it must create recurring value for its investors and its clients – and there is recognition within (and without) than the industry has to.

To help investors, disclosure could be more like the banks; and to help its clients and the greater environment, the industry needs to proactively manage risk.

Risk management in engineering and construction is no longer an oxymoron; and this means that while men will be men, some of them are behaving a little less badly.

I conclude with a quote. It's always good to start with a quote and finish with one – and, even better, make the gap in between as short as possible.

So here it is: “If you take no risks, you will suffer no defeats. But if you take no risks, you will win no victories”.

The only problem with this one is who said it: Richard M. Nixon, the flawed US president who was forced to resign from office after his team were caught electronically eavesdropping on political opponents. Clearly Nixon had never heard of risk management, otherwise he would have: not done it in the first place; not have gotten caught; or once found out, not had to resign. Thank you.

**ENDS**