

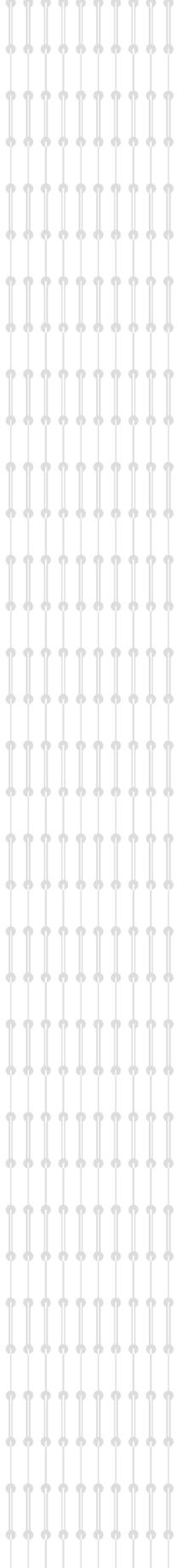


CENTRE FOR ADVANCED ENGINEERING • CHRISTCHURCH • NEW ZEALAND

The Contract in Successful Project Management

**Innovations in Contract Forms &
Dispute Prevention and Resolution**

Ernesto Henriod & Jason Le Masurier - Editors



The Contract in Successful Project Management

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EDITORS

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Foreword

David Elms, CAE

The reason for this book is simply that the nature of project-oriented contracts has been evolving in recent times, and newer and more cost-effective approaches have been developed. They can offer significant advantages over traditional forms, but have not yet been widely used within New Zealand and the broader region of Oceania and Asia. The book aims to show what is going on in different parts of the world. It deals with advantages and disadvantages, and gives historical and philosophical backgrounds to show the sources of ideas.

There is a sense in which this book is a shop window. It shows a range of new forms of contract and of methods of managing the relationships between contractors and clients. Though it cannot be totally inclusive, it deals with the major innovative approaches. Many readers will know about some, but most will not know all.

There is a big step between simply knowing about a new form of contract or approach and understanding how and where it can best be used. The book discusses and explores the pros and cons, the different forms, and where they are best suited. The contract form must be matched to its context. Moreover, the context is wider than just the nature of a particular project. Legal frameworks and insurance attitudes will also set limits on what can be done. These issues must be understood before the user can have a rich picture of the possibilities. It is important to see the whole picture and not just the separate parts, and so understand how the different approaches relate to each other. It is also helpful to get a better understanding of the obstacles preventing ready uptake of new approaches. For instance, there is an underlying conservatism in the construction industry. Its fragmented nature tends to make players risk averse, seeking the protection and comfort of known methods rather than looking for opportunity.

CAE became involved when it was pointed out there was a need in the construction industry. New approaches to project contracts were being increasingly used internationally because they led to more cost-effective results and also to greater efficiency in project performance. “The development of ‘relationship-based’ contracts such as partnering, designed to motivate joint success on an open book, risk and reward basis, has enabled substantial performance and cost improvements to be achieved, particularly in offshore oil and gas industry”.¹ Again, “UK construction appears to be already achieving productivity gains of 5% a year. Some of the best UK and US projects demonstrate increases equivalent to 10%-15% a year”.² Though it makes great economic sense for clients and contractors to improve their efficiency,

¹ Blockley, D I and Godfey, P (2000) *Doing it Differently: Systems for Rethinking Construction*. Thomas Telford, London.

² Department of the Environment, Transport and Regions (1998) *Rethinking Construction*. London.

it is also significant from a national point of view. The point is made later in the book that the construction industry in New Zealand represents about 15% of GDP, so a 5% improvement would mean a substantial gain.

A second reason for CAE involvement is that there is a close relationship between risk management and project contracts, so the topic fits into CAE's broader risk management programme.

Risk management can be thought of as primarily a process of controlling and managing uncertainty.³ Drawing up a contract and assessing risk are both concerned with what will happen in the future, which necessarily involves uncertainty. Both deal with decisions to be made in the present relating to the future, and the precise nature of the future events will be unknown. A good way to look at the nature of newer forms of contract is therefore to use the analogy with risk management to tease out ideas, possibilities and questions. Before we do so, note that risk management in an organisation is ideally focused more on opportunity rather than on protection. It is managing *with* risk – of knowing how to go ahead while accepting uncertainty – rather than a management *of* risk, which implies minimising risk rather than maximising opportunity. The same is true for a contract, except that now there are two parties involved, which brings in the additional issue of how the risk, for better or worse, is shared between the two.

So therefore, as CAE is interested in promoting good practice in risk management in all its forms, it is interested in promoting newer and more effective forms of project contracts and their management.

Uncertainty takes many forms, and has many sources and degrees. Ideally, the form of contract should not only deal with uncertainty, but should also be tailored to the precise form of uncertainty that arises in a particular project.

For example, the INCIS project of the New Zealand Police was an IT project where there was a high degree of uncertainty. The uncertainty was partly to do with the very high rate of change of IT technology during the course of the project, but it also arose from changes in aims and changes in governance as the project proceeded. The project did not achieve its original objectives, and the subsequent Ministerial Inquiry questioned whether the form of contract used was appropriate for the high degree of uncertainty inherent in the process.⁴ There was a mismatch between form and need.

There are many sources of uncertainty in projects. Some are

- *Changing technology.* The INCIS project is a good example of where fast-changing technologies lead to high uncertainty.

³ Elms, D G (ed) (1998) *Owning the Future: Integrated Risk Management Principles and Practice*. CAE, Christchurch, New Zealand.

⁴ Small, F C (2000) *Ministerial Inquiry into INCIS*. Ministry of Justice, Wellington, New Zealand.

- *Complexity.* The greater the complexity of a project, the greater the likelihood of unexpected and counter-intuitive occurrences. The more complex the situation, the less easy it is to describe it and predict its outcomes with any precision.
- *Changing information.* For almost all projects it is not possible to know all the relevant information from the beginning, but for some the degree of uncertainty is very large. Work involving foundations or soil behaviour is a case in point. This led to the development of the Observational Method, which is essentially a design-as-you go approach. It is sensible and effective, but it is seldom used, firstly because it does not fit well with traditional forms of contract, and secondly because clients have not liked to proceed with a project facing a high degree of cost uncertainty. They would prefer to buy certainty by pushing the risk on to the contractor, at a cost.
- *Changing requirements and understanding.* A client's requirements may change during the course of a project with increased understanding of its possibilities, and also through changes in personnel. To some degree this is inevitable for every project. But traditional forms of contract are based on the fiction that change does not happen. There is a desperate grasping for certainty.
- *Inexperience.* A further source of uncertainty lies in inexperience. It might be inexperience in a design or construction team, but it might equally well be inexperience arising from new materials or new methods of design, construction or management.

There are other aspects of uncertainty. Factual uncertainty, for instance, can be contrasted with financial uncertainty. Moreover, the two are not independent. It might be appropriate to accept greater uncertainty in the expectation that, overall, the cost will be lower and the effectiveness of the project will be improved. The main point, though, is that a project will always have an environment of uncertainty. It is crucial to match the form of contract to the uncertainty-environment of the project.

So far we have talked of uncertainty rather than risk as a whole, which involves both uncertainty and costs (or benefits).

A key aspect of contract risk is the way in which the risks in a project are to be divided between client and contractor. The right balance must be found. It is seldom sensible to try to put all the risk on one party. It is certainly not appropriate either, to try to hide the risks or to assume they do not exist. Some forms of contract might have clauses that quite inappropriately leave one party liable, even to the extent of increasing the total risk to the project.

Every project is a process, and it is important that the contract should recognise this. The process view of projects is the central theme of a significant recent book on the construction industry.⁵ The book responds to a major review of the

⁵ Blockley, D I and Godfrey, P (2000) *Doing it Differently: Systems for Rethinking Construction*. Thomas Telford, London.

construction industry mounted by the British government.⁶ Newer forms of contract are generally much better at recognising the process nature of a project, and in fact they can sometimes be seen as management processes rather than contracts in a traditional sense. Blockley and Godfrey take a systems approach, which is scarcely surprising as it could be argued that all substantial risk management exercises must be based on a system framework.

This is no place to explore the characteristics of processes in detail. I make one point only, that an essential part of any process is feedback. Even the simplest tasks are impossible without feedback of some sort. I cannot move a book from one point on a desk to another without seeing or feeling or hearing what I am doing. I need to know I am holding it, I need to see that it has reached the intended place, and I need to feel that it has left my hand.

The analogy with contracts is that if they are to have a part in controlling the course and process of a project, then they must contain elements of feedback. Thus incentives or penalties related to performance are important. There are many types of incentive, and these are best related to the specific nature of the project. For example, performance-based contracts for highway maintenance might include rent payable by the contractor for occupying the highway – a strong incentive for completing the job quickly.

In its eleven chapters the book progresses from background ideas through descriptions of newer forms of contract to, finally, practical details such as dispute resolution. Chapter 1 argues that there are deep set cultural problems reducing the effectiveness of the construction industry, but that the new contract forms contain two major currents of change. They are a change from an adversarial to a collaborative culture, and changes in the underlying form of contracts. I would add a third reason for change, which is that the development of modern methods for quantifying and formally specifying uncertainty can make for greater transparency of risk sharing in contracts.

Chapter 2 shows that there are fundamental problems of compatibility between the law (and its tacit cultural assumptions) and the needs and intent of contracts. It could even perhaps be said that good law is incompatible with good contract outcomes. The newer contract approaches have the ability to transcend the law. Chapter 3 gives some history and show the great changes that have taken place between Hammurabi's ancient code⁷ and the NEC, representing the most modern forms. (Hammurabi focused on draconian penalties for non-performance, which we can assume led to inevitable inefficiencies in Assyrian building practice). Chapter 4 reviews risk management, and gives a rough taxonomy to help understanding.

The next three chapters deal specifically with the FIDIC New Suite, the NEC and

⁶ Department of the Environment, Transport and Regions (1998) *Rethinking Construction*. London.

⁷ Edwards, C (1904), *The Hammurabi Code and the Sinaitic Legislation, with a complete translation of the great Babylonian inscription discovered at Susa*. Watts, London.

NZS 3910. Chapter 8 discusses the culture change to collaborative working approaches such as partnering, with the benefits given as timely completion, cost predictability and job satisfaction. Chapter 9 deals with neutrals as part of the contract, which is common to all the new forms. Chapter 10 talks about causes of contract failure and gives stories of human failure. Finally, Chapter 11 deals with dispute resolution, if disputes should ever occur. The expectation is that with the new forms, disputes would be rare, and this indeed seems to be the case.

Acknowledgements

The Centre for Advanced Engineering (CAE) wishes to acknowledge the collaboration of the Arbitrators' and Mediators' Institution New Zealand (AMINZ), the Institution of Professional Engineers New Zealand (IPENZ), and the Project Management Institution New Zealand (PMINZ) in the preparation and presentation of the Conference from which the papers and notes that follow have been assembled.

Particular thanks are due to Penny Mudford, CEO of AMINZ, Iain Fraser, Fellow and Director (Asia/Pacific) of PMI, John Gardiner, Manager Engineering Practice IPENZ, and Bill Stockman, Executive Director Arrow International for their encouragement to CAE in organising the Conference.

We also thank our two Peer Reviewers: John Burrows who, not content with presenting one of the key papers in the Conference, accepted the task of reviewing the book from a contract law perspective and Ron Holbrook who gave us the benefit of his technical and project management expertise when reading through the papers and providing us with his valuable comments.

Special thanks are due to all our keynote speakers and those who actively took part in the discussions and enriched the content of the Conference for the benefit of all who took part and — we hope — all who enjoy reading and applying the lessons contained in this book.

Finally, we would like to acknowledge the extensive contribution of Charles Hendtlass who has so ably managed the production and publication of the book.

In Appendix B you will find descriptions of all the institutions mentioned in the first paragraph.

Ernesto Henriod
Jason Le Masurier

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The key objectives of any contract are to achieve the required output, at the agreed time, and within budget. The failure to achieve one or more of these objectives is a basic contract risk. Not all these risks can be foreseen and assigned to the parties by the contract; nor are they engineering, physical or financial risks usually covered by insurance. Contract failure cannot be measured or described mathematically or assigned to clever computer models. It arises, first, from the basic documents that govern the human relationships involved in managing a contract, and second, from the general culture medium for the engineering industry in which the contract must be managed.

Since the onset of the modern construction contract, which emerged from the Industrial Revolution and the great engineers of the time — the Brunels, Smeatons, Stephensons and Watts of the 19th century — the contract forms used in engineering had been gathering legal wordage, increasing in complexity, filling up with demanding language, and becoming couched in terms that fostered adversarial relationships among the parties. The culture of confrontation was one of the dominant features of the construction industry over the better part of two centuries. The only winners in the traditional contracting game were those who could interpret the complex contracts to their own advantage, or those who lived on the fringes of engineering but reaped the fruits of the culture of *disputology*.¹

The culture of “them and us” was perhaps deeply rooted in the legal systems and civil rules and procedures, which are currently undergoing dramatic changes in the UK. To quote the Hon Mr Justice Hartmann², “The old spirit was more of a warrior code, the tactics of combat dictated by which side you represented. That has been fine, no doubt, for those initiated into the code, the civil litigation lawyers. But Lord Woolf³ found that litigants were, in the main, not satisfied with the system. They criticized it for being too slow and far too uncertain, too expensive, incomprehensible to the uninitiated and too susceptible to abuse.”

Many great and smaller projects reached completion and achieved their quality, time and cost goals: for instance, in the 1960s, Mangla Dam in Pakistan achieved all this in an environment of close collaboration among all the parties to the contract: client, consultant, contractor and financier. This was no mean achievement for a US\$500 million dollar contract, at the time the largest contract ever financed

¹ Disputology: a term coined by the late Sir Michael Kerr when giving the Keating lecture in 1996. It describes the business of, on the one hand, creating opportunities for disputes and, on the other hand, attending to their resolution.

² “East greets West—new opportunities for dispute resolution”. The Hon Justice Michael Hartmann, Judge of the High Court of Hong Kong. *Asian Dispute Review*, May 2002.

³ The Lord Chief Justice.

by the World Bank. However, the 1960s and 1970s also saw many disastrous contracts — typified by the Kariba Stage 2 contract, and the demise of a major British contractor. By and large, the construction industry had acquired a bad name. Huge increases in cost, delays in completion, crippling strikes, failed contractors and contract abandonment were all too common, and had a heavy cost for the whole economy.

Could the responsibility for the poor performance of the industry be pinned on to one particular participant or stakeholder in the sector? Not really — the culture of suspicion, confrontation and abuse affected all sides:

- the **owners**, who felt exposed to abusive charges, and sought to protect themselves, first, by awarding contracts to the lowest bidder, often with little regard to qualifications, and then by insisting on tight and demanding conditions of contract. In some cases, governments, as the owners, refrained from employing contractors and resorted to their own forces — this was almost a blind alley for civil engineering in New Zealand where, until the 1990s, most heavy civil construction work was carried out by the Ministry of Works, thwarting the development of a domestic competitive civil construction capability.
- their **consultants** (project designers and contract supervisors) who did not always behave in the impartial and altruistic fashion expected of the engineer or the architect, and occasionally were seen to follow courses of action to protect their own interests, or blatantly side with the owners.
- the **contractors**, who found themselves pinned down by crippling price competition and by the exigencies of owners and consultants, while trying to make a profit. The survivors resorted to looking for loopholes in contracts and specifications, creating opportunities for pricing claims and variations and introducing quality shortcuts, forming pricing clubs, and squeezing their supporting subcontractors and suppliers. Many resorted to the expedient of low pricing to maintain an inflow of tendered work; moneys from the new contracts would plug the financial holes of the previous work, until the chain broke down.
- Finally, the **financiers**, who focused on the recovery of their principal and interest, applied financial stringencies on owners and contractors, increasing collateral requirements or slowing cash flows. Delays in payments eventually led to cost over-runs, or failures. This was particularly true in government-financed work — and it is still a problem in developing countries.

Poor performance by the construction sector is intolerable for any country. Its economic significance is highlighted by statistical figures from the World Bank that show that between 30% and 60% of the gross domestic fixed capital formation is contributed by construction. In New Zealand, it is estimated that the construction sector contributes upwards of 15% to the GDP.

However, the last decade of the 20th century witnessed a revolution in the

management of the risk of contract failure.

The construction industry and the learned institutions grouping consultants and engineers involved in the industry realised that reform was necessary, to bring a constructive, collaborative attitude and an environment incorporating all the participants. By the mid 1980s, an inspired group of professionals, under the umbrella of the Institution of Civil Engineers (ICE) in London, started work on a new approach at contract drafting, looking for simpler, clearer forms, showing a fair allocation of risk, and incorporating processes to simplify contract management on the basis of solid logic and communications. At about the same time, on the US West Coast, contracts for excavation of highway tunnels, long plagued by disputes and work disruption, saw the introduction of a ‘neutral’, as an integral participant in the contract, there to prevent disputes if possible, and resolve them if they arose.

Those were two great currents of change. These led, on the one hand, to the emergence of the Disputes Review Boards⁴ and the formal incorporation of neutrals in contracts — later adopted more generally under various guises: the Adjudicators, Neutrals and Dispute Adjudication Boards now used in various forms of contract. On the other hand, reform currents led to the issue of the New Engineering Contract of the ICE in 1993, hailed as the first true reform of the Contract since the 1800s.

The realisation that excellent results were attainable through collaboration between the parties, fair sharing of contract risk, and the prevention or amicable resolution of disputes led, in turn, to the resurgence of approaches that had been tried in the past but had largely been dormant: partnering, observational method, target cost contracts, privately-financed infrastructure projects (the ‘BOT family’) and design-build, for example. The new contract culture has thus resulted in approaches applicable where mutual respect and trust are present.

Our Conference

The Centre for Advanced Engineering of New Zealand (CAE) undertook to bring the new currents and developments in contracting under review in a major conference staged in Christchurch in February 2002, with the collaboration of the Institution of Professional Engineers NZ (IPENZ), the Arbitrators and Mediators Institute New Zealand (AMINZ), and the Project Management Institute NZ (PMINZ). A group of distinguished international and NZ speakers presented substantive papers to an audience of engineers, project managers, lawyers, arbitrators and contract experts.

In this book we present the conference papers as read by their authors, or edited into chapters that bring together various contributions, as well as additional information available after the event. The aim is to give the reader a well-rounded

⁴ The Disputes Review Boards have been formalised and become an accepted and well-tried contract device. The name has recently been modified by the DRB Foundation, to “Disputes Resolution Boards”.

Introduction

background of the process of reform, starting with the legal background, describing and commenting on the existing and new forms of contract, the new approaches to contracting, and the means for preventing and resolving disputes. The reader's attention is also drawn to contract failure and the consequences of escalating disputes to arbitration or the courts of law. This is perhaps a 'carrot and stick' scenario: thou shalt manage your contract properly, or thou shalt be condemned to disputing a case in arbitration or in the courts of justice!

Brief descriptions of the institutions that supported the conference, and summary biographies of the authors of the papers, are given in Appendix B.

Abstract

The common law of contract — indeed any law of contract — has its limitations in regulating the construction industry, including:

- First, a contract is created by agreement between the parties to it, and binds only them. The law of contract has thus not been a satisfactory vehicle for regulating the tender process, or the relations between owner and subcontractor. The interventions of the non-contractual tort of negligence have been erratic.
- Second, the common law requirement of consideration has impeded the ability of the parties to vary a contract once made.
- Third, the law of contract does not always cope well with unanticipated changes of circumstance during performance. The losses caused by all but the most cataclysmic changes of circumstance lie where they fall unless the contract provides otherwise. Nor have the common law courts been sympathetic to open-ended clauses, particularly those providing for future agreement or negotiation between the parties. Unlike some other legal systems the common law has traditionally not recognised an obligation of good faith in negotiation or performance. Bluntly put, if the parties have failed to provide for something in their contract the law will not do it for them.
- Fourth, it is probably not unfair to say that the common law courts have in the past taken an exceedingly literal approach to interpretation, and have been accused of arriving at results out of line with commercial reality. And, finally, the remedies known to the common law are very limited: monetary damages and termination are the main ones.

Some of these deficiencies can be put right by careful contract drafting; some cannot. The main forms of forms of construction contract — ICE, JCT, FIDIC, and the rest — are well known. They fulfil several functions. One is obviously to set out the fundamental obligations of the parties. Another is to fill the above holes in the common law: where the risk of unexpected impediments is to lie; how variations are to be dealt with; the provision of additional remedies, such as suspension; and default mechanisms if the parties cannot agree. All these involve policy rather than legal decisions on which different minds may differ, and the different contracts do it in different ways. The law's tendency to literalism has led to attempts to spell these things out in considerable detail and in many words. But such is the variety of commercial life that no-one could ever hope to foresee and provide for everything, so whatever the level of detail, cases will always arise where the contract does not provide a clear answer, and ingenuity can always find, or create, ambiguity. So over time the contract will be amended to plug the gaps that have been found in it. This can lead to the document growing like Topsy and, quite often, the creation of new uncertainties.

Contracts, which must try to achieve certainty and allocation of risk by telescoping the future into the present, can never do a perfect job.

There are recent signs that the common law is becoming more flexible on some fundamental matters. There is a call for interpretation which emphasises commercial sense and purpose rather than the letter of the document; the courts appear to be getting more tolerant of agreements to agree; there is even talk of a requirement of good faith. Academics speak of a theory of “relational” contracting, although it has so far failed to deliver much.

There is a movement towards plain English drafting of contracts. The New Engineering Contract (NEC) is a remarkably simple document. Recent developments holding considerable promise seem to me to be those which transcend the law of contract. One is the concept of partnering which emphasises co-operation, sharing of strategy, and trust, most of which operates “off contract”. The rapid modern development of alternative dispute resolution (ADR) offers an opportunity for more flexible, and hopefully amicable, resolution of the inevitable differences of opinion.

Introduction

We must not expect too much of the law of contract, particularly in complex transactions such as those in the construction industry. There are difficulties with our traditional law of contract, especially the British model. There are signs that the courts are beginning to sort some of them out, but the pull of tradition is strong. But however perfect our law of contract is now, or may some day become, it still cannot be expected to solve all problems that may arise in the course of a project. Life is too unpredictable.

Some Features of the Law of Contract

The British law of contract, which is the basis for much international dealing in the construction industry, is a rigid and formal construct created by the courts and rationalised by the text writers in 19th century England. It has been said by one judge that the law has “committed itself to a rather technical and schematic doctrine of contract”.¹

Here are some of the problems of the classic law of contract and their effects.

Agreement between the parties

A contract requires an agreement, usually created by offer and acceptance, between two or more parties. It cannot bind people outside the relationship; a contract is a sealed compartment. That has several implications.

Firstly, it has given the law a conceptual puzzle in trying to counter abuse of the tender process. On the traditional view there is only a contract when a tender has been accepted: a tender is an offer, and the acceptance of the successful tender seals the contract. Unsuccessful tenderers have no contract with anyone. If an unsuccessful tenderer complains that the advertised tender process has been abused by the owner, the law has long found difficulty in finding a legal peg on which he or she can hang the complaint. At last the courts have come to his or her aid by inventing a highly artificial ‘process’ contract collateral to the main one. Its effect is that the call for tenders is sometimes (but not always) an *offer* that the advertised process will be followed. It is *accepted* by anyone submitting a tender². That is a strange sort of contract; it would have been tidier to say simply that the law, quite independently of contract, expects good faith in the tender process, but we do not have the mechanism for that.

Secondly, the pyramid of contracts in a construction project is complex and unique. The rule that contracts bind only the parties to them means that subcontractors are not directly responsible to the principal, and in turn have no recourse against the principal. Engineers are not directly responsible to contractors or subcontractors. The problems that the insolvency of contractors can cause to subcontractors are

¹ Lord Wilberforce in *NZ Shipping Co Ltd v AM Satterthwaite & Co Ltd* [1975] AC 154 at 167.

² See for example *Pratt Contractors Ltd v Palmerston North City Council* [1995] 1 NZLR 469.

devastating and well-known, and have to do with much more than just the limitations of the law of contract. Only statute can rectify the situation, and New Zealand is currently making (another) attempt at it³: the last one failed.

Sometimes the tort of negligence, which operates independently of contract, can intervene to provide remedies for parties outside the contract relationship. But that has been unpredictable and erratic. In a very few cases subcontractors have been found liable in tort for negligent work⁴; contractors can sometimes be liable to subsequent purchasers of the building⁵; there is a difference between the UK and New Zealand as to whether a council and its inspectors can be liable to a building owner for negligent inspection.⁶ And the law is showing considerable timidity in finding professionals such as engineers liable to contractors and subcontractors for defective design or the specification of unsuitable products.⁷ All this is because the courts are worried about upsetting the established patterns of contract and the ‘certainty’ those patterns have engendered in the industry. That is evident from a recent New Zealand Court of Appeal case where a contractor sued an engineering company for alleged negligence in preparing a mechanical services specification that recommended a heating system that did not work. The majority of the Court of Appeal, dismissing the claim, said:⁸

“In a comprehensive contractual situation such as existed here, the Court should be hesitant to go beyond that relationship. A tortious duty of care outside that framework, but affecting the rights and liabilities of the various separate parties coming within the very contractual setting, should not lightly be imposed.”

The futures of contract

The paradigm around which our law of contract developed was the single-event contract which is made and performed quickly. The law of contract does not cope so well with long-term contracts which encounter unanticipated changes of circumstance during their performance. It is of course beyond the wit of a drafter, and the resources of language, to anticipate and precisely provide in advance for every eventuality which might happen over future months or years. You cannot telescope the future into the present and cover all possibilities in a verbal formula. Yet despite this obvious truism, the law has traditionally been unforgiving when changes of circumstance do occur. Let me give a few examples.

Firstly, British law regards contract promises as absolute. It will not absolve a party from performance, nor will it modify an obligation, just because it has

³ The Construction Contracts Bill 2001 - see below.

⁴ *Junior Books Ltd v Veitchi Co Ltd* [1983] AC 520. But the case is not popular; it has been said to be unique, and not to lay down any general principle: *D&F Estates Ltd v Church Commissioners for England* [1989] AC 177.

⁵ At least in New Zealand: *Bowen v Paramount Builders (Hamilton) Ltd* [1977] 1 NZLR 394.

⁶ cf *Murphy v Brentwood DC* [1991] 1 AC 391 (UK) and *Invercargill CC v Hamlin* [1996] 1 NZLR 513 (NZ).

⁷ The law dates back to the 1876 case of *Thorn v London Corporation* (1876) 1 App Cas 120.

⁸ *R M Turton & Co Ltd v Kerslake & Partners* [2000] 3 NZLR 406 at 418.

become more difficult or expensive to perform. It will only absolve from performance if there has been a totally devastating external occurrence which has made performance impossible or virtually so. The case books are littered with examples of builders who have been held to their contracts without relief despite the fact that site conditions were much more difficult than anticipated; that labour was in shorter supply; and that prices of material had rocketed.⁹ Contract is about allocation of risk, and it is the parties' job to provide for that in their contract. If they do not make just provision, the court will not do it for them.

Secondly, if the parties' contract contains gaps in that they have entirely failed to provide for a particular contingency, the courts will sometimes imply a term to deal with it, but only if very stringent conditions are met. The court must be satisfied that it is simply giving effect to the parties' obvious but unexpressed intent. This is a judicial test commonly cited:¹⁰

“An unexpressed term can be implied if and only if the court finds that the parties must have intended that term to form part of their contract: it is not enough for the court to find that such a term would have been adopted by the parties as reasonable men if it had been suggested to them: it must have been a term that went without saying, a term necessary to give business efficacy to the contract, a term which, although tacit, formed part of the contract which the parties made for themselves.”

These two problems have been compounded by the courts' traditional unwillingness to allow the parties too much flexibility. The next three examples demonstrate that.

Thirdly, the doctrine of consideration (which holds that a promise is not enforceable unless the promisor gets something in return for it) means that agreed variations of the contract may be unenforceable unless the contract itself provides for them. Thus, if it emerges during the performance of a contract that the contractor has quoted too low on an item, a gentlemen's agreement to raise the price will be of no legal effect unless the job itself is correspondingly changed: otherwise the owner is getting nothing in return for his promise to raise the price. Recent authority has mollified this principle by providing that consideration is present if the variation results in a practical benefit for both sides¹¹; but some contract purists have great difficulty accepting this triumph of practical reality over legal nicety.

Fourthly, the law of contract has traditionally been unwilling to countenance open-ended contractual terms. So, while there has not been total consistency

⁹ See *Wilkins & Davies Construction Ltd v Geraldine Borough* [1958] NZLR 985 and *Davis Contractors Ltd v Fareham UDC* [1956] AC 696.

¹⁰ *Trollope & Colls Ltd v North Western Metropolitan Regional Hospital Board* [1973] 1 WLR 601 at 609.

¹¹ *Williams v Roffey Bros & Nicholls (Contractors) Ltd* [1991] 1 QB 1.

about this, there is authority that leaving a provision open to further agreement can be fatal to the existence of any contract at all.¹² Thus, a term providing that, say, the price of an item will be “as agreed from time to time” has sometimes resulted in a holding that there is presently no contract at all. That is ostensibly for either of two reasons: that the parties, having acknowledged that there is more agreeing to do, cannot have intended to be bound yet; or that if the parties fail to agree, there is no standard by which an adjudicative body can fix the price for them. Agreements to negotiate terms in good faith have not fared much better. A member of the House of Lords rationalised it thus:¹³

“The reason why an agreement to negotiate, like an agreement to agree, is unenforceable, is simply because it lacks the necessary certainty...”

The concept of a duty to carry on negotiations in good faith is inherently repugnant to the adversarial position of the parties when involved in negotiations. Each party to the negotiations is entitled to pursue his (or her) own interest, so long as he avoids making misrepresentations. To advance that interest he must be entitled, if he thinks it appropriate, to threaten to withdraw from further negotiations...

How is the court to police such an ‘agreement?’ A duty to negotiate in good faith is as unworkable in practice as it is inherently inconsistent with the position of a negotiating party.”

Fifthly, the courts have not been much inclined to imply duties of ‘cooperation’. A court once said that, apart from express terms, “the law can enforce cooperation only in a limited degree — to the extent that it is necessary to make the contract workable.”¹⁴ Nor has there been much warmth towards the introduction into British (including New Zealand) law of a doctrine of good faith. Judges have found the expression difficult to pin down; and I think there may be a suspicion, too, as to whether in the cauldron of commercialism much reliance can be placed on it.

In respect of both these last two matters, there are recent signs of a change of attitude. There is now pretty much general acceptance that agreements to agree should not be automatically struck down, provided there is a fall-back machinery or an objective standard which can be employed if the ‘agreement to agree’ produces no fruit. But despite this shift in attitude the Court of Appeal recently found a Heads of Agreement unenforceable simply because it left too much unsettled.¹⁵ There are also some signs that a general doctrine of good faith may be in the wind, but it still has a long way to go. At least one New Zealand judge, now retired, has argued strongly for it.¹⁶

¹² e.g. *Barrett v IBC International Ltd* [1995] 3 NZLR 170.

¹³ *Walford v Miles* [1992] 2 AC 128 at 138 per Lord Ackner.

¹⁴ *Mona Oil Equipment Co. v Rhodesia Railways Ltd* [1949] 2 All E.R. 1014 at 1018 per Devlin J.

¹⁵ *Electricity Corporation of NZ v Fletcher Challenge Energy Ltd* (2001) 7 NZBLC 103, 477.

Interpretation

The next problem I shall address is not so much one of the law of contract as such, but rather one of judicial approach. It relates to the way courts interpret contracts. In times past there was a tendency for the common law courts (with a few exceptions) to take a rather literal view of the interpretation of contracts, and indeed of all sorts of legal document. There could be an over-concentration on the minutiae of language and grammar, and a failure to place the words in context and to pay attention to the overall purpose of the contract. It was almost as if there was a belief that words have one plain meaning, and that you can discern it by poring over the four corners of the document without so much as raising your eyes or reflecting on what the contract was trying to achieve. The result, in construction contracts, has sometimes been decisions which have been divorced from commercial reality. To use Duncan Wallace's words, this approach has produced, in a regrettable number of cases, "results at serious odds with the aim or purpose of the transaction viewed as a whole". He instances such examples as the holding that a certificate of completion exempts the builder from all liability for defects, even where legal proceedings have been commenced before the certificate; and the holding that no extension of time could be granted in respect of stage 2 of a project despite the fact it had started late due to excusable delays in the completion of stage 1.¹⁷ Again, I would emphasise that this kind of outcome was by no means universal, but there certainly were plenty of examples of it.

This old literal approach is fast disappearing. As recently as 1998 the House of Lords, in a judgment cited numerous times since, said something must be done about it.¹⁸ Contracts should not be interpreted in a vacuum, but in the light of the surrounding 'factual matrix', and decisions should be arrived at which give effect to commercial purpose and business common sense. One should not be tripped up by the narrow literal meaning of words. It is hardly possible to disagree with that, but it is not without practical problems. To fully understand the 'factual matrix' might require lawyers and judges to be fully informed about practice and custom in the construction industry. It is a complex industry, and many lawyers, and I venture to say judges, have little experience of it. It is a big ask to require that within the narrow confines of the courtroom, constrained by the limitations of legal argument, they can ever become thoroughly familiar with this complex subject.

Moreover explanations of the 'factual matrix' can undesirably lengthen proceedings, and there are risks that much of it may be irrelevant to the problem in the case. These problems have begun to manifest themselves in New Zealand in the four years since the House of Lords case, and have been the subject of terse comment in the Court of Appeal.¹⁹ It is difficult to have it both ways. One cannot but

¹⁶ Thomas J. See his latest exposition of it in *Bobux Marketing Ltd v Raynor Marketing Ltd* CA 245/00, 3 Oct 2001.

¹⁷ Hudson's *Building Contracts* 11th edn 1995 at 117.

¹⁸ *Investors' Corporation Scheme Ltd v West Bromwich Building Society* [1998] 1 All ER 98.

¹⁹ e.g. *Pyne Gould Guinness Ltd v Montgomery Watson (NZ) Ltd* CA 28/99, 16 Nov 1999.

welcome the advocacy of a purposive as opposed to a literalist approach, yet one must acknowledge the difficulties that come with it.

Remedies

The common law knows only two major remedies for breach of contract: monetary damages and, in the case of substantial breach, cancellation. It also has power, in some cases where a contract has fallen through, to award restitutionary relief. Equity supplements this with the injunction (an order not to do something) and specific performance (an order to perform the contract). These equitable remedies are effective, but are in the discretion of the court, and are seldom regarded as appropriate in building contracts.

So at common law the remedies of damages and cancellation are effectively all there is. They operate in an all-or-nothing fashion; that is a result of the adversary system. If you win you recover all your damages; if you cancel the contract it is terminated for good. There are no half measures. Restitutionary relief has grave limitations at common law too: if a lump sum contract was terminated before completion the builder got nothing if he was at fault. The common law had no means of spreading loss; the courts applied all-or-nothing rules rather than discretion. In New Zealand we have some statutes — in particular the Contractual Remedies Act 1979 — that depart from that paradigm and allow a court some discretion to distribute money and property in a fair way, but we are exceptional in that.

The Standard Forms of Contract

I have outlined some features of the classic law of contract. The well-known standard forms of construction contract were developed at a time when that classic law was at its height. It influenced contract drafters in a number of ways:

- It encouraged very detailed drafting, because if the drafter did not put something in the court would not imply it.
- It required certainty and precision in drafting, because the law did not like open-endedness.
- It required a lot of words to make sure everything was covered, because what was written was liable to be narrowly and literally interpreted.

Let us now turn to the standard forms.

Their content

Some of the problems which I have addressed cannot be solved by any sort of drafting: the rule that contracts do not bind third persons is one; the style of interpretation is another, because that is a judicial activity which cannot be dictated by the contracting parties. But the others can be avoided, or mitigated, by careful

drafting of the contract, and that is precisely what the law invites. The parties can provide for their own allocation of the risks of unforeseen events, their own procedures for dealing with changes in circumstance, and their own remedies.

The common standard forms are well known: the British contracts ICE and JCT; the big international player FIDIC; and in New Zealand NZSS 623 (now replaced by NZS 3910) and the Institute of Architects contract. Apart from fixing the fundamentals like price and time, they provide the sort of detail of which I have spoken.

Firstly, they all allocate the risk of future uncertain events: weather, price rises and so on. They tend to use formulae such as “conditions not reasonably foreseeable by an experienced contractor”. How they allocate those risks, and who bears the brunt of them, differs from contract to contract. This is not a legal question, but a policy one which the industry and the contract drafters must sort out. Whether you agree with the solution depends on which camp you are in. Duncan Wallace said of the 5th edition of ICE that it moved risk unacceptably towards the owner. In his inimitable style he said:²⁰

“Those familiar with the evolution of the standard forms in the building and civil engineering industries in the United Kingdom have come to expect a steady tide of revision against the commercial interest of the employer and in favour of the contractor in particular in permitting more and more financial claims to be made by the latter — with the result that the original quoted contract price becomes less and less realistic, and little more than a lure for unwary employers to enter into projects which they would not undertake if the ultimate true cost was known to them.

But in the case of the present ‘revision’, that tide has now become a torrent... It is difficult to see why anyone with a full understanding of the practical consequences of the changes should have approved of the terms of the new contract on behalf of employers.”

Two of those responsible for the drafting of the 5th edition (Sir William Harris and Mr David Gardam QC) tartly responded:²¹

“Mr Wallace’s attitude is one which was widely adopted in England in the nineteenth century and no doubt it could be argued that a policy along the lines which he suggests should be adopted today. Unfortunately, however, he obscures any merit in his viewpoint by regarding contracts for civil engineering works as a battle between the Contractor — in dishonest collusion with suppliers and sub-contractors — and the Employer — aided by incompetent allies in

²⁰ *New Civil Engineer* Nov 1, 1973, reprinted in Duncan Wallace, *The ICE Conditions of Contract 5th edn: A Commentary*, 1978 at 345.

²¹ *New Civil Engineer* Dec 20 1973, reprinted in Duncan Wallace at 357.

the shape of engineers and unknowledgeable legal advisers — in which battle the Contractor is for ever “going over to the attack,” preparing “traps” for the Employer and the Engineer.”

In their experience, such a view of the industry was “completely unreal”.

Secondly, the contracts have traditionally placed substantial responsibility on the engineer for approving variations, time extensions and payments, and deciding disputes. There is of course much practical sense in having a single administrator and decision-maker. But what this also achieves is the advance prescription and objective certainty the law requires. The contract provides in advance for the possibility of variation, and provides a single mechanism removed from the parties for achieving it. But the responsibility this has placed on the engineer is enormous, and, I think, pretty much unique in our law. The engineer is both an agent of the employer and an independent decision-maker. As Lord Reid put it, he has:²²

“...two different types of function to perform. In many matters he is bound to act on his client’s instructions, whether he agrees with them or not; but in many other matters requiring professional skill he must form and act on his own opinion.”

That is a heavy and unusual burden. Modern contracts introduce other and more evidently neutral dispute adjudicators.

Thirdly, most contracts provide for remedies, and modes of enforcement and dispute resolution, beyond anything the common law could achieve. They provide for termination in a range of circumstances going beyond those which would justify cancellation at common law; they provide for suspension of work in defined circumstances. The old NZSS 623 used to provide also for the interesting device of allowing the employer to take possession of the works: I see it has gone in the modern version. Moreover, the contracts tend also to provide for arbitration to resolve disputes, and the more modern ones envisage mediation and other forms of alternative dispute resolution. It is worth noting that total exclusion of resort to the courts is not possible unless statute allows it; the legal system perceives the courts as the central enforcers, and any attempt to exclude access to them completely is illegal. But you can provide for another form of dispute resolution as first choice, leaving the courts as a second alternative. Also, as I said, statute can modify this. New Zealand’s arbitration legislation does retain a limited right of recourse to the courts, but it differs according to whether the arbitration is domestic or international. I note here also that the Construction Contracts Bill currently before the New Zealand parliament provides for a type of adjudication which can run concurrently with other mechanisms for dispute resolution.

Their effectiveness

As I have said, the contracts contain much detail. In addition, some versions,

²² *Sutcliffe v Thackrah* [1974] AC 727 at 737.

particularly the older ones, were subject to the vices endemic in British legal drafting. They used many surplus words and repetition; they were not very well ordered; they contained archaisms like ‘aforesaid’ and ‘hereintofore’; the sentences were often unreasonably long, sometimes more than 200 words.²³ The flurry of words was in part a reaction to the court’s approach: if there is a danger the court will interpret a word literally and narrowly, you use another word as well, and another and another, to make sure nothing is left out. I once asked an experienced draftsman (a senior government official) why he drafted with such verbosity and he replied “You have to make it judge-proof.” That was, of course not the only reason. Drafters had just traditionally done it that way. There was also a resistance to change, based on a (spurious) fear that chaos would ensue if the old forms, encrusted with court precedents, were abandoned.

Yet this style of drafting has real problems. Firstly, it creates obscurity. A judge of the New South Wales Supreme Court stigmatised certain construction contracts as “unduly prolix, repetitive, and often unclear in their meaning”. Many of the conditions, he said, were “not models of clear thinking or reasonable draftsmanship.”²⁴ For this reason I suspect many contractors, and indeed other professionals, never read the small print. The desire to be comprehensive often detracts from the need to be comprehensible. Communication comes second.

Secondly, this desire to provide for everything can never achieve its object anyway. Complete coverage is unattainable. No one can predict everything that can go wrong with a project and provide for it in advance. And language does not have mathematical precision: it is often open to argument whether a word or phrase is apt to cover an event which has happened. Sometimes even a phrase which can seem crystal clear in the abstract can be thrown into confusion when you try to apply it to some unforeseen contingency.

So what happens? Even the most comprehensive contract will require interpretation, and cannot be thoroughly understood unless it is read in the light of numerous court cases interpreting its words. Books have been written about the standard forms. Often those books, useful though they are, express doubts as to what some of the clauses mean.

Another inevitability is that gaps are always being found in contracts; and, paradoxically, the more detailed and precise a contract is, the more gaps are likely to emerge. So the contract then needs to be amended and added to, and that can compound the problem. Here, again, is Duncan Wallace, speaking of the 5th edition of ICE:²⁵

“Inevitably, given the obscurity and complication of much of the

²³ The longest sentence I know of in a New Zealand legal document is 1299 words with no punctuation at all (I am indebted to Peter Butt who discovered it).

²⁴ Smart J (1989) 5 BCL 7, cited in Hudson (above n 17) at 118.

²⁵ Duncan Wallace (above n 20) at p1.

language of the Fourth Edition, and the special drafting difficulties of any piecemeal task of modification and amendment of a lengthy document, there are many areas of difficulty and obscurity in the new contract, as well as inconsistencies or overlapping.”

Lord Justice Parker once said of such contracts that “they are apt to be somewhat like Topsy and they just grow without anybody thinking very much what is happening during the course of growth”.²⁶

Modern Developments

Where do we go from here? There are a number of promising developments. Other presenters will be more up to date with them than I am. Here are some of the things that are happening.

The courts and the common law

The courts, and the law of contract, are in the throes of change, but much remains to be done. Precedent is hard to shift.

I have already foreshadowed these developments. To summarise:

- Non-contractual rules, such as those in the tort of negligence, are affecting the contractual purity (I might also mention estoppel and some statutory interventions).
- One-sided variations of contract are tolerated in some situations.
- There is greater determination to give effect to open-ended terms provided the court is satisfied that the parties **intended** to be bound by a contractual relationship.
- There is more talk of “good faith”, although it is yet far from acceptance as a general ingredient in all contractual relationships. Britain’s membership of Europe, where the concept is better known, may influence developments there.
- There is continual emphasis that contract interpretation should be purposive rather than narrowly literal; it should lead to decisions which exhibit business common sense.

The new contracts

The contract forms have been changing too.

Plain Drafting

There is a move towards plain English drafting, not just in contracts but also in statutes and other types of legal document. I believe it works. It involves the

²⁶ *Mander Raikes & Marshall (a firm) v Severn-Trent Water Authority* (1980) 16 BLR 34 at 43.

presentation of the message in as direct and uncomplicated a fashion as possible. Superfluous words, repetition and archaic expressions are eliminated; tortuous grammar is avoided; long sentences and paragraphs are broken up into shorter ones; the whole document is better ordered and flows more logically. Quite often detail can be reduced and replaced by statements of principle. Plain English drafting does not always result in a shorter document, but it usually does:²⁷ it depends on the subject matter, and how much detail is necessary to do an effective job. I think construction contracts will always require a fair amount of detail.

When you see how good some of the modern drafting is it makes you wonder why we persisted for so long with the windy, verbose, traditional style. Some of the revised construction contracts are fine examples of what can be achieved. The drafters have virtually started from square one. NZS 3910 is much clearer than the old NZSS 623. The 1999 FIDIC is a much more elegant document than its predecessors, although no shorter: its comprehensibility is due to short sentences. And the New Engineering Contract (NEC), a quite revolutionary document, is beautifully simple. Some of its sentences are little more than one line, and none are more than 40 words, and it is drafted in the present tense, eliminating the traditional 'shall'. (Ironically lawyers, long derided for their incomprehensible prose, have participated in this drive for clarity: the more tortuous jargon-ridden styles have now shifted to other professions.)

But there is one catch. More economical styles of drafting can make new demands on an interpreter. The less detailed the drafting and the more reliance on principle, the more one depends on an interpretation which is sympathetic to purpose and not entangled in literalism.

Cooperation and Good Faith

Some new forms of contract — including the NEC — use terms such as “will cooperate”, “will use best endeavours”, and even “will act in good faith”. They are starting to appear in contracts other than construction contracts too. Because they are express terms, the courts (in the rare cases that come before them) have had to try to give them meaning. This is new territory. The courts have said they mean that:

- each party will act in a way which will advance the common objectives of the parties; and
- good faith is an excluder, in that it excludes obstructive conduct and conduct which is in bad faith.

²⁷ There are some striking examples in New Zealand statute law. For example s5(4) of the Interpretation Act 1999 contains 18 words, compared with 85 words in the 1924 version which it replaced. In his book *FIDIC 4th A Practical Legal Guide* (1991) Mr E C Corbett provides for each clause of FIDIC a plain English paraphrase which, he says, is “to enable the reader to understand the gist of the clause as quickly as possible”(at vii). In every case his version is much shorter and clearer, and it is hard to find anything of substance that is omitted.

Apart from that, though, what is required depends on the wording, the context, and the objectives of the contract in question.²⁸ There is some working out to do.

Partnering

Some see partnering as the way of the future. The experiences of it, particularly in the United Kingdom, are reportedly most favourable. It involves the major players in a project agreeing on common goals and strategies and the maximisation of joint resources. They agree to work together in a spirit of goodwill, trust and cooperation. Trust and teamwork prevail over the adversarial approach.

Perhaps this is no more than a formalisation of what some businesses have been doing, *de facto*, for a long time. It emphasises good old-fashioned values like mutual respect. Socio-legal studies dating back nearly 40 years have shown that in many commercial dealings parties who know and trust each other make their dealings work without recourse to the law at all; indeed much of what happens in the performance and progress of their projects bears little relation to the strict legal position or even the wording of their contracts. They rely on common sense, and sort things out as they go along.

Partnering arrangements differ. Some are in the form of charters (which may not be contracts at all); others are more detailed and formalised. The view a court of law would take of them is unknown, and if they do their job as they are intended to may remain unknown. No doubt there are sceptics who will ask what happens if the relationship breaks down, or who will wonder whether cooperation could lead to a cosiness which encourages compromise. But those with experience of the new system are most enthusiastic.

Alternative Dispute Resolution

Most of the newer forms of contract now provide for the resolution of disputes outside the courts. They doubtless take pressure off the engineer as well. The 1999 FIDIC sets up a Dispute Adjudication Board which aims for amicable settlement; arbitration is available if that fails. NZS 3910 provides for an engineer's review, mediation, and arbitration. NEC sets up an adjudicator. ADR has exciting possibilities. It is private, and, hopefully, quicker than court proceedings (although not necessarily cheaper). Most importantly, it substitutes for a court's win/lose decision the possibility of a consensually agreed settlement aided by a person who is a specialist in the area. It enables inventive solutions. Imposed solutions based on rules sometimes do not work, especially if they are made by people who are not themselves as familiar with the practices of the industry as the parties themselves.

²⁸ See *Symphony Group Ltd v Pacific Heritage (Auckland) Development Ltd* HC Auckland, CP 362/98, 17 August 1998; *NZ Licensed Rest Homes Assoc Inc v Midland Regional Health Authority* HC Hamilton, CP 34/97 15 June 1999 affd CA 17 July 2000. I am indebted for these references to Professor Charles Rickett's paper "Some Reflections on Open-Textured Commercial Contracting" presented to the Centre for Commercial and Corporate Law, Christchurch 11 October 2001.

There are a large number of ADR methods ranging through mediation, mini-trial and appraisal. Some contracts provide for a tiered succession of them to be undertaken in order. (There may be doubts as to the wisdom of this several-bites-at-the-cherry approach). Lawyers may also reflect on a system which aims to keep the new forms of contract out of the courts: there would then be no binding law at all on their correct interpretation. The nature, and effectiveness, of ADR is the subject of other chapters in this book.

Statute

Finally, in areas where the law has not operated smoothly, parliament can always step in with a legislative solution. In New Zealand that has happened more than in many other countries. Our law of contract is now peppered with statutes dealing with such matters as remedies for breach, mistake, illegality and misleading conduct. Some of these statutes can be overridden by the parties' express agreement, some (like the Fair Trading Act) cannot.

The new Construction Contracts Bill currently before Parliament in this country will impose a statutory regime, which cannot be contracted out of, on certain aspects of construction contracts. In particular it will outlaw 'pay if paid' clauses; it will allow for suspension of work if payment is not made; it will provide a method of 'quick and dirty' adjudication of disputes which is supposed to co-exist with other forms of dispute resolution; and it provides in a limited way for charges over land.

Statutory intervention like this is sometimes necessary, but almost always there is difficulty dovetailing the new legislation with the existing law and the terms of the parties' contract. Sometimes it can cut across them. The New Zealand bill, if passed, is going to require some relearning.

Evolution of the Engineering Contract

Ernesto Henriod

Abstract

The trail of the evolution of the modern construction contract starts in earliest recorded history, with the Hammurabi codes. Construction contracts have also been recorded in ancient Egypt, although the great works of antiquity — such as the pyramids — were usually developed as labour-only contracts.

An important stage of development of the construction contract was reached in Roman times. Some of the principles developed in that era have been reflected in today's contract law. After the demise of the Roman Empire, and the ensuing period of obscurity in the Middle Ages, Common Law arose gradually, together with the principles upon which formal construction contracts would take shape in the Industrial Revolution.

The standard forms of construction contracts developed in Great Britain in the late 19th century were the precursors of the modern ICE and other institutional forms of contract. The ICE Conditions of Contract were later followed by FIDIC in the drafting of their Red Book and other engineering contract forms, which have now been replaced by the FIDIC Suite of Contracts of 1999. The Institution of Civil Engineers also took a further step forward, with the drafting and issue of the New Engineering Contract, which changed the literary style and management approach of the traditional forms. Concurrently, a change in the culture of the construction industry, away from confrontation and towards collaboration, allowed the resurgence of contract arrangements based on mutual trust and respect among the contracting parties.

In the following pages we review briefly the evolution of the engineering contract, as a preamble to the discussion of the current state of the art of contract drafting and contract management. In collating this account, we have drawn from papers written by Martin Barnes, published in *Civil Engineering*, a journal of the Institution of Civil Engineers, London, from books published by Nael Bunni, and from various other texts on business law and contracts, listed in the footnotes. We have particularly focused on the development of the construction contract in the British Isles — leading to the ICE standard form, the precursor of earlier FIDIC forms and leading also to the New Engineering Contract. New Zealand, the Commonwealth and many other countries have drawn from that experience to formulate their own contract standards, as have the international development banks.

Introduction

A contract has been defined as “an agreement, upon sufficient consideration, to do or not to do a particular thing”. A more specific approach is to define contract in terms of the element which is common to all contracts: a promise. Accordingly, a brief but acceptable definition is a “*promise enforceable by law*”.¹

In spite of such a simple definition, contract law did not arise in pre-commercial societies. Even in trade based on barter, the exchange concluded the deal, and there was little or no recourse to further payment or adjustment of the traded goods. In other words, after the goods had changed hands, there was no need to offer or record a further promise regarding those goods.

Ancient History

A culture of business and a market economy had to develop before contract law became necessary. The earliest recorded history of contracts being used as the basis for commercial transactions dates back to the Egyptian and Mesopotamian cultures of between 3,000 and 4,000 years before our era. Perhaps the most famous and earliest record of codified construction law is contained in Hammurabi’s Code of 1760 BC. In his book on construction insurance², Nael Bunni gives a few examples of the Hammurabi rules pertaining to construction. These include:

“#229: If a builder builds a house for a man and does not make its construction firm and the house which he has built collapses and causes the death of the owner of the house that builder shall be put to death.

#232: If it destroys property, he shall restore whatever it destroyed, and because he did not make the house which he built firm and it collapsed, he shall rebuild the house which collapsed at his own expense.

#233: If a builder builds a house for a man and does not make its construction meet the requirements and a wall falls in, that builder shall strengthen the wall at his own expense.”

These and other rules of the Hammurabi Code defined construction risk and responsibility, and the manner in which failure to perform would be treated. The Code required that the builder would *promise* to deliver a safe and sound house, in accordance with the requirements of the owner, or face the consequences of his failure to perform.

The great works of antiquity, however, tended to be built by massed labour, under the direct management of the state. The Great Pyramid of Giza, for example,

¹ *Business Law*, Fifth Edition. Len Young Smith, G Gale Roberson et al, West Publishing Co, St Paul, Minnesota, 1982

² *Construction Insurance*. Nael G Bunni, Elsevier Applied Science Publishers, London and New York, 1986

was built without recourse to power or machinery. It demanded a high degree of organisation, to round up a force made up, in part, of slaves from lands conquered by the dominant culture, and farmers who had to contribute their work as a primitive form of taxation. The architects of such grandiose works were members of the rulers' courts, highly respected and close to the pharaoh. The relationship between the master builder and the labour organisers required a form of 'labour only' contract, specifying the rules of their employment: labourers were not expendable, and the duration of their work and their health and safety were protected.

Roman Times

The development of construction management reached a peak during Roman times, reflecting a long economic, political, social and legal evolution. Justinian's law books of the 6th century AD recognised various types of contract, and determined their enforceability by the courts and state administrators. "The Romans built their roads and aqueducts with what we now regard as a very modern approach to contract strategy and the management principles that lie behind it. They were masters of delegation and distribution of responsibility around a large team of contributors to a civil engineering scheme. They did it with a well-developed understanding of incentives and motivation. The modern concept of partnering would have been familiar to them."³

Contract law and construction management continued to evolve until the demise of the Roman Empire and the onset of the Dark Ages, when the western world changed from an urbanised, organised society into disperse agrarian communities and the Roman administrators were replaced by weaker institutions.

Common Law

The next important development came after the Norman conquest of England, when formal contracts, issued under written and sealed promise, became enforceable under law. Later, failed oral promises first became recognised as deceit, treated as a tort. By the early 17th century, the common law courts accepted the enforcement of simple contracts, i.e. promises given not under seal. After a long period of development, the courts finally focused on the presence of consideration as the prime test of enforceability of a contract. Thus we come to the present day definition of an enforceable contract⁴, which must be based on an offer and the acceptance of that offer, made and accepted by parties having capacity to contract; the agreement must be based on a promise to perform a certain contractual matter that must be legal, and must be supported by consideration.

³ "Civil Engineering Management in the Industrial Revolution". Martin Barnes, *Civil Engineering No 138*, August 2000

⁴ *Business Law, Principles and Cases*, Second Edition. Harold F Lusk, Charles M Hewitt et al, Richard D Irwin Inc, Homewood, Illinois, 1970

Early Contracting in the UK

This general concept of contract law was translated to the construction contract as it evolved from the start of the great civil engineering works in Great Britain. The pioneering works were those of the canal network, a primary transportation grid developed between 1760 and 1830. The volume of civil engineering construction, already substantial at the time of the construction of the canal network, increased dramatically after the development of steam engines and the advent of the railways late in the Industrial Revolution. Such volume required the rise of a new professional activity — that of the civil engineer and master builder of canals, rail lines, tunnels and bridges.

Those were tentative times, in terms of the contractual arrangements and styles of management being used by the various practitioners. They varied from the labour-only types of contract preferred by James Brindley, and the competitive bids preferred by others, to the direct contracting of works with tried contractors, as favoured by Thomas Telford. The styles of management ranged from the openly conflictive and dictatorial manner of Isambard Kingdom Brunel, to the collaborative approach of John Rennie. There were many forms of contract in use, practically as many as master builders or engineers were in the business of developing the great works of the times.

Those early, tentative days saw the introduction of principles that were later incorporated into standard forms. John Smeaton introduced the concept of the ‘resident engineer’, as a delegate of the engineer in chief. This concept was later further developed by Joseph Locke, whose contracts referred to the Engineer, as the decision-maker, sovereign arbitrator and amicable judge. Others found problems, devised ways to resolve them, and coined phrases and drafted contract clauses to suit those circumstances: Robert Stephenson, for example, had to deal with ‘unforeseen ground conditions’ in tunnel construction. His approach at catering for the presence of unanticipated site problems was to enter into contracts with no completion date or final cost — a precursor of today’s ‘observational’ contracts, used where site conditions are indeterminate.

Some of the problems that would later plague the industry also arose in those times. Robert Stephenson found difficulties with the indiscriminate award of contracts to the lowest bidders: “many of the contractors got into difficulties and the company had to take over the work by direct management.”⁵ And Brunel, clearly one of the pioneers of civil engineering construction, was such a poor project manager that many of his contracts were late, over budget, and ended in disputes. Brunel’s contracts placed the Contractor at the mercy of the Engineer. His “dictatorial approach to contractors produced many disputed claims which were subsequently taken up by the contractors through the courts”.⁵ Thus, he was also a precursor of the adversarial culture which dominated a considerable part of the construction industry over the next century.

⁵ Martin Barnes, see footnote 3.

The Industrial Era and the ICE Conditions of Contract

As the Industrial Revolution moved into the industrial era, a milestone in the development of the modern contract form was reached in the 1860s, with the drafting of the contracts for the construction of major sewers in London and embankments on the river Thames by Sir Joseph Bazalgette. This form of contract was adopted by the (London) Metropolitan Board of Works as a standard, and “remained the principal model for well over 100 years; it was the model for the first edition of the ICE contract published in 1945.”⁶

The ICE Conditions of Contract were revised a number of times, until they reached their present form in 1973. By then, the document had been sanctioned by the Federation of Civil Engineering Contractors and the UK Association of Consulting Engineers.

Many professional organisations around the world used the ICE Conditions of Contract as the model for their own standard documents. Among them, the International Federation of Consulting Engineers, generally known by its French acronym, FIDIC, who issued its third edition of the ‘Red Book’, *Conditions of Contract for Works of Civil Engineering Construction* in 1977, based on the ICE model of 1973.⁷

FIDIC and the International Contract Forms

Nael Bunni comments, “Originally, these documents were drafted in precise, legal language which would remain unequivocal even when subjected to detailed and hostile scrutiny by astute legal minds. However, as revisions were incorporated, the language became more and more complicated and inscrutable.”⁸ Bunni carried out a study of the text of the FIDIC Conditions of Contract, and found that the sentences were so long and complex, that 86% of them could theoretically only be understood by 4% of the population, equivalent to those having an IQ of 130 or greater.

In spite of its complex structure and phrasing, the FIDIC Conditions of Contract remained the only accepted international form of contract and, over the years, the document became supported by an extensive history of court cases to assist in the interpretation of its clauses. Thus, the international development banks — notably the World Bank and the Asian and Inter-American Development Banks — adopted the FIDIC Conditions of Contract for their Standard Bidding Documents (SBDs).

The current issues of the SBDs still incorporate the 4th Edition of the FIDIC Red Book, as amended in 1992. The banks are currently discussing closer coordination of their SBDs, and considering how to adopt the latest version of the FIDIC forms of contract.

⁶ Martin Barnes, see footnote 3.

⁷ *FIDIC 4th—A Practical Guide*. E C Corbett, Sweet & Maxwell, London, 1991.

⁸ Nael G Bunni, see Footnote 2.

The New Engineering Contract

The challenge of resolving the complexity of the language in the 1973 ICE Conditions of Contract and its derivatives prompted the Institution of Civil Engineers to embark upon the drafting of a new set of conditions of contract in 1985.

The initial concept for this new approach arose from a radical reform of project management systems funded by the British Property Foundation (BPF). The BPF system was based on a fundamental review of management processes and contract relationships. A manual was published by the BPF in 1983, but it was little used, as it was not supported by suitable conditions of contract.⁹

However, the Manual provided the prototype for the work begun in 1985 on the development of a totally new form of contract for engineering work.

This was the first attempt at reform in over 100 years and it resulted in the issue of the New Engineering Contract (NEC) in 1993. The NEC is based on best modern project management principles; it is designed to cater for the various relationships required by a modern engineering project; it uses simple procedures and language, with terminology that can be used not only in civil engineering construction, but in engineering projects more generally; it was developed using flow charts so that the processes it involves are logically complete and can be represented in a computer system to handle the information flows; and all the processes it embodies have been designed to reward cooperative behaviour, instead of adversarial attitudes and behaviour, by the participants in a contract.

The NEC has now been adopted widely: it is being used in about 90% of all infrastructure projects in the UK, and is currently in use in over 20 countries around the world. According to Barnes, its use has led to smooth management of projects, to the point that the Adjudicators have very little work in the resolution of disputes, and there have been no court cases arising from claims and disputes.¹⁰

A prototype of the NEC was incorporated in the preparation of the World Bank's Sample Bidding Documents for Smaller Works (SBD-SW), first issued as a 'Test Edition' in December 1991, amended in 1992, and finally issued as a Standard Bidding Document in 1995.

Barnes collaborated with World Bank staff in the production of this document, which met general approval among its users, to the point that it was adopted by some governments for the development of their own standard conditions of contract. The issue of the SBD—SW, which marked a departure by the development banks from the traditional forms of contract, may have prompted other review and redrafting work by international agencies.

⁹ The story of the development of the New Engineering Contract draws from the paper on "Civil Engineering Management in the New Millennium" by Martin Barnes, *Civil Engineering*, No. 138, May 2000. Martin Barnes headed the team that developed the NEC.

¹⁰ Martin Barnes, at the CAE Conference on *The Contract in Successful Project Management*, Christchurch, New Zealand, February 2002.

The New FIDIC Suite of Contract Forms

The FIDIC principals realised that they had to update their Red Book, still based on the ICE 1973 standard, as well as their other contract forms for engineering work. Their drafting work resulted in the issue, in 1999, of the new FIDIC suite of conditions of contract. The new documents did not refer to the specific type of project but, rather, were based on the allocation of the design function: the new Red Book is for building and engineering works designed by the Employer; the new Yellow Book for electrical and mechanical plant and building and engineering work designed by the Contractor; and the Silver Book is for turnkey projects. The language has been much simplified, albeit at the expense of the length of the documents: the new Red Book has 26% more words than the old Red Book (30,431 vs 23,544). Given the change of orientation of the documents, the comparison is perhaps not strictly correct — it can just be taken as a general indication of the effort expended in the simplification of language, and the decompression of the old legalese shorthand. In addition, the new suite of contract documents contain amendments (such as the price adjustment formula, the contract neutral and certain guarantee conditions) that the development banks, in the past, had had to incorporate in Part II (Conditions of Particular Application) appended to the basic FIDIC contract.

‘Contract Neutrals’

Another important modern development has been that of the incorporation of a neutral within the contract. This is not an ad-hoc ‘mediator’ brought in only when a dispute arises; rather, the neutral is appointed in the contract, and keeps a watching brief over the development of the project. The neutral is therefore in a prime position to defuse issues as they arise — and, since the neutrals are usually professional people or panels of very high repute, experienced in the type of contract under supervision, their counsel has been respected by all participants.

The most important initiative related to *contract neutrals* arose in the north-west of the USA, in the 1980s. Highway tunnel projects had been the subject of many disputes. Panels of three experts were appointed to act as ‘Dispute Review Boards’ (DRBs), keeping track of development of the projects and assisting in the resolution of problems as they arose. They were hugely successful.

The use of DRBs quickly extended to other contracts and countries: the World Bank pioneered its use in an international contract for the El Cajon Dam, in Honduras, in 1985, and later incorporated DRBs in its Standard Bidding Documents, as from the 1991 issue. The latest statistics published by the DRB Foundation show that DRBs have been used in 822 projects, with a total contract value of US\$68.7 billion. The Boards have issued 1,038 formal recommendations — and only 31 cases developed into disputes that had to be dealt with beyond the DRB (no less than 15 of the latter cases arose in a single contract fraught with difficulties). This is an extraordinary record, which prompted the DRB Foundation to propose

to change the name of the panels, to ‘Dispute Resolution Boards’.¹¹

The contract “neutrals” have been adopted in the NEC, where an Adjudicator serves in that function and is appointed *ab initio*, as are the Disputes Adjudication Boards (DABs) now included in the FIDIC suite of conditions of contract.

The last decades have also brought about a change of culture in the construction industry, away from confrontation and towards cooperation among the parties to a contract. In turn, this has made it possible for new approaches to project management to come back in fashion, approaches that require mutual respect and collaboration. These are not new forms of contract, they are variants or supplemental agreements. They have been used in the past with the conditions of contract existing at the time, provided there was good will and close understanding among the participants. However, the improved cultural environment of the industry, and the existence of more manageable forms of contract (particularly the NEC), have fostered the resurgence of partnering, target contracts, guaranteed maximum price contracts, design-build and other variants of performance-based contracts.

In New Zealand

The current basic contract document issued by NZ Standards is NZS 3910:1998, *Conditions of Contract for Building and Civil Engineering Construction*. It was preceded by NZS 3910:1987, NZMP 3911:1992, NZMP 3912:1992 and NZMP 3914:1994. In turn, these derived from NZS 623P:1984 and NZS 623:1964.¹²

NZS 3910:1998 draws from the long tradition of British contracts, but has developed beyond the 1973 ICE model. It maintains the use of plain language, and is attuned to changes of law prior to 2002: the Building Act 1991, the Health and Safety in Employment Act of 1992, the Companies Act of 1993 and the Arbitration Act of 1996. It includes provision for the amicable resolution of disputes (albeit not a neutral appointed *ab initio*), seeking to avoid the expense and delay of arbitration.

A further revision of NZS 3910 is currently being processed, at the same time as a new Act on construction contracts makes its way through Parliament. This may be an excellent opportunity to incorporate the neutrals in the New Zealand Standard, not just as ad-hoc mediators but as participants from the start of the Contract.

A more detailed review of NZS 3910 and other New Zealand forms of contract — and a comparison with other standard forms — is given in Chapter 7.

¹¹ *Forum*, Volume 6, Issue 1, January 2002. The Dispute Review Board Foundation, Seattle, Washington, USA. The change to Dispute Resolution Board Foundation is subject to consultation with Foundation members.

¹² From the Foreword: New Zealand Standard 3910:1998

4

Risk Management

Nael G Bunni, Jason Le Masurier & Patrick Tuohey

Abstract

As discussed in earlier chapters, contracts are among the tools available for risk management in projects. In that context, risk management is generally perceived as one aspect of project management. However, in a broader sense, project management itself can be viewed as a form of risk management. In the first part of this chapter, a paper by Nael Bunni considers the former, established view. His paper defines risk and the process of risk management, and then discusses the allocation of risk and consequent liability with particular reference to the FIDIC conditions of contract.

In the second part of the chapter, Jason Le Masurier considers the broader view of risks associated with particular management approaches and concomitant project culture.

He proposes the observational method as a generic model for managing project uncertainties, allowing minimisation of risk and maximisation of opportunity.

In the third part, Patrick Tuohey continues the broader view of project risk management and describes the process of the Australian and New Zealand Standard on risk management. He examines how these processes are being used in the development and implementation of contracts in the construction industry.

Part 1: Sharing Risk through Contractual Relationships

Nael G Bunni

Introduction

The subject of risk, its assessment, allocation and management has developed and been applied on an increasing scale over the last twenty years. New regulations, such as the Health and Safety at Work Regulations introduced in a number of jurisdictions, and in particular those recently imposed in the European Union, gave the subject of risk an even greater significance. Under the UK Construction (Design and Management) Regulations of 1994, there is a requirement to carry out risk assessment of planned work at different stages of the construction project, and to take reasonable measures to deal effectively with any significant risk.

However, there is little uniformity of approach to the topic of risk and, surprisingly, only a few useful general practical applications have been developed in this area. The lack of uniformity extends even to the definition of 'risk' and what is meant by it.

Etymologically, the origin of the word 'risk' in English ('risque' in French; 'riesgo' in Spanish and 'rischio' in Italian) is uncertain. The Latin word 'resecum', meaning 'danger' or 'rock', may throw some light on its origin but — leaving aside etymological considerations — the Chinese 'wej-ji' with the characters representing 'chance' and 'danger', is more illustrative of the concept of risk, as it applies to the construction industry today. This concept has evolved with these two notions embodied in it. It encompasses with every decision one makes, not only the danger of a loss but also the chance of either obviating it or the chance of making a consequent gain.¹

Decision-making often, if not always, involves some risk taking. However, the well-informed decision maker will be aware of the risks associated with a made decision and will endeavour to reduce all foreseeable harmful effects and their consequences to an acceptable minimum.

The Definition of 'Risk'

Risk is defined by British Standard 4778² as "*A combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequences of the occurrence*". In the same British Standard, the definition of hazard is given as "*A situation that could occur during the lifetime of a product,*

¹ Nael G Bunni, "The FIDIC Form of Contract – The Fourth Edition of the Red Book", Blackwell Science, second edition, Chapter 7, Oxford, 1997.

² British Standard No. 4778: *Quality Vocabulary*, Part 3, Section 3.1: 1991, The British Standard Institution, Milton Keynes, UK. The author notes that the NZ Standard is more accurate as it allows for risk to include positive as well as negative events by replacing the word 'hazard' by 'event'.

system or plant that has the potential for human injury, damage to property, damage to the environment, or economic loss”. Based on these two definitions, risk may be expressed in the form of a mathematical equation, as follows:

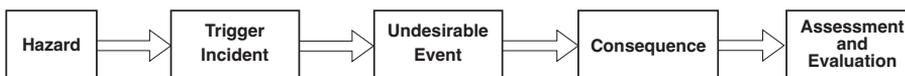
$$R = P \times C,$$

in which R is Risk, P the Probability, or frequency, of the occurrence of a defined hazard, and C the Consequences of the occurrence of that hazard.

There are a number of points that flow from the meaning of risk and its mathematical expression shown above, as follows:

- An undesirable event may have a number of different causative factors, of which one, or any combination, could lead to its occurrence. For example, if the undesirable event is the collapse of a cofferdam at a construction site, such collapse may have been caused as a result of bad ground conditions, material failure, defective design, or a combination of some or all of these factors. All these factors are referred to as hazards.
- A hazard can, therefore, be construed as a dormant potential for inconvenience, loss, damage to property, damage to the environment, moral damage, injury or loss of life. To eventuate, it is triggered by a particular incident, which may be referred to as a *‘triggering incident’*. A triggering incident is usually necessary for a hazard to eventuate into an undesirable event. For example, if the cofferdam collapse mentioned above was due to a defective section in its wall, the triggering incident could be the imposition of an additional loading beyond the limit sustainable by that defective section.
- The hazard may result in different levels of severity or magnitude of consequences depending on the particular circumstances and timing of the event. For example, the consequence of the collapse of the cofferdam mentioned above may be a financial loss in the form of the cost of the repair to the cofferdam, or it may extend to a critical delay in the completion of the project, or it may go beyond the financial loss and delay into personal injury and death.
- Expressing risk in a mathematical formula permits and facilitates a comparison of the magnitude of the various risks to which a project is exposed. Such a comparative analysis may then be used to decide on whether to accept a particular risk or take measures to eliminate it or, at least, to mitigate its effect.

In summary, when a hazard eventuates into an undesirable event, the sequence of events can best be expressed as follows:



Any assessment and evaluation carried out on these consequences may be used subsequently in the measurement of risk in relation to that particular hazard.

Measurement of Risk

As explained above, when considering the acceptability of a particular risk or when comparing risks in a particular project or a number of projects, it is useful to have the formula referred to in the previous section. Considering the first variable, the consequences of an undesirable event, British Standard No. 4778 classifies the consequences of hazards into four categories of severity:

- negligible;
- controlled or marginal;
- critical; and
- catastrophic.

This classification is based on the effect produced once the hazard is triggered into an event, and may include any one, or a combination of: loss of life, personal injury, damage to reputation, material damage, financial loss, loss of time, and mental distress. Therefore, the consequences of a hazard resulting in an undesirable event range from those which are negligible and can be disregarded, to those at the other end of the scale which would include loss of life, personal injury, or material loss of various types.

In order to express this variable, the consequences of hazards, as numerical data for insertion in the above formula of $R = P \times C$, a number of categories can be extrapolated from BS 4778, to each of which a range of numerical values can be assigned. The basis of these values may differ from one situation to another so, for example, they may be based on the expected economic loss, expressed as a percentage of the overall cost of the venture or the project:

Category of loss	The consequences of a hazard eventuating	Percentage of cost of project
0	No Loss	Nil - 0.09
1	Nuisance type small losses	0.1- 0.99
3	Medium Losses which can be borne by the individual concerned	1- 4
5	Large losses	10 – 19
6	Probable maximum loss in the range of the largest previous losses of similar projects	20 – 40
7	Serious and exceeding any previous events	41 – 80
10	Catastrophic - total loss	81 - 100

Other sets of categories can be worked out for different ventures or projects.

Values for the second variable, probability of occurrence, can be calculated by

setting a range from 0 to 1. For example:

Probability of Occurrence	The Event
0	It is certain that no loss would occur - loss is not possible
0.3	Slight probability of occurrence
0.5	Equal chance of occurrence or non-occurrence
0.7	Strong probability of occurrence
1.0	Certain to occur

The probability of occurrence of many undesirable events can be calculated from data available from various existing sources. Where such data is unavailable, a best estimate based on experience and common sense could be used. In this regard, it is important to note that the probability of occurrence refers only to occurrences during the period of the particular contract.

Various methods and formulae are available for the calculation of probability. Indeed, within the field of statistics, probability is a major field of study, and the literature indicates the development of an ever-increasing range of computerised statistical modelling techniques in the calculation of risk.

Risk Management

As stated earlier, risk management is “*the process whereby decisions are made to accept a known or assessed risk and/or the implementation of actions to reduce the consequences or probability of occurrence*”. It is also concerned with the mitigation of those risks deriving from unavoidable hazards through the optimum specification of warning and safety devices and risk control procedures, such as contingency plans and emergency actions.

If a decision is made to accept a risk, a further decision must be made on whether or not the risk should be shared. Before such decisions can be made, it is necessary to go through a systematic process that involves analysis of the possible hazards to which the project may be exposed and evaluation of their intensity, frequency and return period. In this regard, the following terms and definitions from BS 4778 are relevant:

Hazard analysis	The identification of hazards and the consequences of the credible accident sequences of each hazard.
Risk quantification	The estimation of a given risk by a statistical and/or analytical modelling process.
Risk evaluation	The appraisal of the significance of a given quantitative (or, when acceptable, qualitative) measure of risk.

Risk assessment	The integrated analysis of the risks inherent in a product, system or plant and their significance in an appropriate context.
Risk criteria	A qualitative and quantitative statement of the acceptable standard of risk with which the assessed risk needs to be compared.

Allocation of Risks and their Management

When hazards and risks are identified, assessed and analysed, they must be allocated to and managed by one or more of the various parties involved. Allocation and management of the hazards and risks would keep them under control, prevent the occurrence of any harmful consequences or mitigate such consequences should they eventuate, thus reducing the extent of harm. Such allocation is part of the risk management process, where the party to whom a certain hazard and associated risk are allocated should be selected in accordance with certain rules rather than haphazardly (see Figures 1 to 3 at the end of this paper).

The conclusions of one of the earliest papers on this topic remain valid today, where the rules for allocation of risks in a construction project were stated to revolve around the ability of a party to:³

- control any arrangements which might be required to deal with the hazard or any triggering incident relating to it;
- control the risk or to influence any of its resultant effects;
- perform a task relating to the project, such as, obtaining and maintaining insurance cover; and
- benefit from the project.⁴

Although these rules were contemplated in 1983, their application was very recently preferred to any other rules by a major report commissioned by the Government of Hong Kong SAR, on the allocation and management of risk in the procurement of construction projects.⁵ These rules and others were later debated at a conference

³ Max W Abrahamson, "Risk Management", [1983] ICLR 241, also published as Appendix J to a discussion paper on *Construction, Insurance and Law* published by FIDIC - 1986, page 49; see also "Defects: A summary and analysis of American Law", Justin Sweet, a paper published in *Selected Problems of Construction Law, International Approach*, by Peter Gauch (Switzerland) and Justin Sweet (USA), University Press, Fribourg, Switzerland, Sweet & Maxwell, London, 1983, page 97.

⁴ As an example of the 'benefit' principle, although referred to as 'incentive' and not benefit, we can look at the NEC, which is commented on in the Grove Report, referred to below in footnote 5, in the following manner: "The NEC is said to have introduced a variant of the management standard which might be called the philosophy of incentive. The postulate is that risks should be placed on the party most in need of incentive (presumably already with the ability) to prevent and control them. This is thought to motivate people to play their part. An examination of the 'compensation events' listed in the NEC does not, however, demonstrate that this philosophy has been uniformly applied."

⁵ "The Grove Report: Key Terms of 12 Leading Construction Contracts Are Compared and Evaluated", published in September 1998 and is available on the web site of Thelen Reid & Priest at www.constructionweblinks.com.

in Hong Kong, which focused on the report and related issues.⁶

It might be worth noting in this connection that if risks are not allocated in a contract and a dispute arises between the parties to that contract as to whom a particular risk is allocated, then an arbitrator or a judge would most likely examine the following criteria for risk allocation and determine the dispute accordingly:

- which party could best foresee that risk?
- which party could best control that risk and its associated hazard or hazards?
- which party could best bear that risk?
- which party most benefits or suffers when that risk eventuates?

There are examples and legal judgments in respect of events, in which the liability was allocated in accordance with each of the above criteria. However, the allocation in construction contracts of the risks is traditionally based on a sharing between the parties involved, in accordance with the provisions of two contracts usually executed between the Parties to a construction contract: The first is between the employer/owner and the design professionals involved; and the second is between the employer/owner and the main contractor. From the latter agreement, flows another line of risk sharing between the main contractor, on the one hand, and sub-contractors, suppliers, manufacturers, insurers and others, on the other hand.

If these risks are analysed on the basis of the effect they generate once they eventuate, two basic types of risk can be identified. The first type incorporates the risks which could lead to damage, physical loss, or injury and the second type incorporates risks which could lead to economic and/or time loss. In both types of risk, the risks allocated to the employer/owner are specified and the remaining risks are allocated to the contractor.

Examples of the first type of risk, which involves damage, physical loss or injury, include defective design, defective material, defective workmanship, Acts of God, fire, human error and failure to take adequate precautions. Examples of the second type include late possession of the site, delay in receipt of information necessary for timely construction, changes in design, and variations to the original contract.⁷

The treatment of these two types of risk in construction contracts differs in that the first type encompasses mainly insurable risks, which are required to be insured, whereas the second type involves, in essence, uninsurable risks.

Unfortunately, the division of risk as referred to above is not clearly and explicitly explained in a number of the well known standard forms of contract, a problem

⁶ A conference in Hong Kong held in November 2000, details of which were given by Humphrey Lloyd in the *International Construction Law Review*, [2000] 2 ICLR 302.

⁷ Nael G Bunni, "Construction, Insurance and Law", a paper delivered at the *Conference on Structural Failure, Product Liability and Technical Insurance*, Technische Universitat, Vienna, 1989, and published subsequently in *Forensic Engineering*, V. 2, Nos. 1/2, page 163, 1990.

that has resulted in major misunderstandings. As an example, the wording of Sub-clause 17.1 of the new suite of FIDIC's forms of Contract, published in September 1999, should have started by explaining that the risks included under Clause 17 of the Conditions are only those risks of loss and damage and not the whole spectrum of the risks to which the project and the parties involved in it are exposed. The term 'Employer's Risks' in the context of this clause should have been replaced by 'Employer's Risks of Loss and Damage', since these risks are confined to those which lead to some form of accidental loss or damage to physical property or personal injury, which in turn may lead to economic and/or time loss risks, directly or through the other clauses of the contract.

As this explanation is not stated in the Conditions, the mistake of referring to the risks under Clause 17 as 'Employer's Risks' could lead to serious danger in that the reader, and of course the user, will conclude that having identified in Clause 17 the Employer's Risks, all the other risks are the Contractors' risks, including the contractual risks in the remaining provisions of the contract.

This problem can be highlighted by reference to Clause 17 of the Orange Book,⁸ where the draftsman fell into that trap and stated expressly in Sub-clause 17.5 that "*The Contractor's risks are all risks other than the Employer's Risks listed in Sub-Clause 17.3*". This mistake has led to many instances of misunderstanding, conflict and at least one serious arbitral proceedings, where the employer pointed out that by sub-clause 17.5 he bears no risks under the contract other than those specified in sub-clause 17.3⁹.

The same could be said about other well-known forms of contract.

Responsibility and Liability

Whatever the rules or the reasons for allocation of risks, the responsibility and liability attaching to these risks, when they eventuate, follow and flow from that allocation. Accordingly, the simplicity and clarity of the wording where such allocation is made is of paramount importance. This means that the contractual arrangements, the legal rules of the applicable law of the contract, and the technical documentation such as any specification and drawings, must be clearly stated and fully understood.

Once liabilities are assigned through the contract documents, the parties involved have the following options to finance the consequences of risks should these risks eventuate:

- (a) To retain the responsibility for financing the costs of loss or damage or injury by providing any one or a combination of the following arrangements:

⁸ The draftsman of the new suite of FIDIC's contracts, published in 1999, applied the same format of the 1995 Orange Book to these new forms.

⁹ Nael G Bunni, "FIDIC's New Suite of Contracts – Clauses 17 to 19: 'Risk, Responsibility, Liability, Indemnity and Force Majeure'", *ICLR*, Vol. 18, Part 3, July 2001.

- (i) an element of their cash flow;
 - (ii) reserves created specifically for the purpose;
 - (iii) funds assigned;
 - (iv) creating captive societies.
- (b) To transfer the responsibility for financing the costs of loss or damage or injury or non-performance to:
- (i) another party to the contract by agreement, thus creating a sharing of risks;
 - (ii) an insurer through an insurance contract that in turn becomes transferred to reinsurers through reinsurance arrangements. An insurer may impose his own risk management conditions, thus creating another cycle of transfer. This second cycle of transfer, which is enforced through either an incentive in premium reductions, or conditions attached to the insurance policies may result in:
 - the insured having to take measures to eliminate or mitigate a certain risk;
 - the insured having to retain part of the responsibility by the imposition of a deductible or excess at the lower end of the scale or a limitation of the part insured at the upper end of the scale;
 - the insured having to retain certain risks through exclusion clauses in the insurance policy; or
 - the insured having to seek another insurance cover from a different insurer.

Indemnity and Insurance

Generally, liabilities arising from the duties and obligations of the parties to a contract should be covered by indemnities given by one party to the other, or provided in the form of insurance policies.

Risk, Responsibility, Liability, Indemnity and Insurance in the FIDIC's New Red, Yellow and Silver Books

One of the common features of all the three new Books of FIDIC is the section on Risk & Responsibility, Insurance and Force Majeure. The wording of Clauses 17, 18 and 19 in the three main contracts (The New Red; New Yellow; and Silver Books) is very similar.

It differs only in the text shown in Tables 1 to 3, which provide a comparison between the wording of these Clauses, using the new Yellow Book as a base-line.

Most of the differences are either of a minor nature or due to the respective role of the ‘Engineer’ or the ‘Employer’ in these Forms.

There are only two significant differences, which are marked with an asterisk.

No.	Clause No.	Yellow	Red	Silver
1	17.1 (a)	"...by reason of the design, execution."	"...by reason of the Contractor's design (if any), the execution..."	Same as Yellow.
2	17.1 (b) (i)	"...by reason of the design, execution..."	"...by reason of the Contractor's design (if any), the execution..."	Same as Yellow.
3	17.1 (b) (ii)	"...breach of the Contract by the Contractor, the Contractor's Personnel, their..."	Same as Yellow.	"...breach of the Contract by the Employer, the Employer's Personnel, their..."
4*	17.3	Risks referred to in Sub-Clause 17.4 are numbered (a) to (h) in Yellow.	Same as Yellow.	Risks (f), (g) and (h) do not appear in Silver.
5	17.4, first paragraph	"...give notice to the Engineer and shall rectify this loss or damage to the extent required by the Engineer."	Same as Yellow.	"...give notice to the Employer and shall rectify this loss or damage to the extent required by the Employer."
6	17.4, second paragraph	"...give a further notice to the Engineer and shall be..."	Same as Yellow.	"...give a further notice to the Employer and shall be..."
7*	17.4 (b), last sentence	"In case of sub-paragraphs (f) and (g) of Sub-Clause 17.3 [Employer's Risks], reasonable profit on the Cost shall also be included."	Same as Yellow.	Does not appear in Silver.
8	17.4, last paragraph	"...this further notice, the Engineer shall proceed..."	Same as Yellow.	"...this further notice, the Employer shall proceed..."
9	17.5(a)	"... compliance with the Employer's Requirements, or..."	"...compliance with the Contract, or..."	Same as Yellow.
10	17.5, fourth paragraph	"...in relation to (i) the Contractor's design, manufacture, construction or execution of the Works, (ii) the use of Contractor's Equipment, or (iii) the proper use of the Works."	"...in relation to (i) the manufacture, use, sale or import of any Goods or (ii) any design for which the Contractor is responsible."	Same as Yellow.

Table 1: Differences between the new Yellow Book compared to the new Red Book and the new Silver Book — Clause 17 Risk and Responsibility

No.	Clause No.	Yellow	Red	Silver
1	18.1, second paragraph, second sentence	"...by both Parties before the date of the Letter of Acceptance."	Same as yellow.	"...by both Parties before they signed the Contract Agreement."
2	18.1, seventh paragraph, last sentence	"Whenever evidence or policies are submitted, the insuring Party shall also give notice to the Engineer."	Same as Yellow.	This sentence does not appear in Silver.
3	18.2, second paragraph	"...damage caused by the Contractor in the course of any other operations (including those under Clause 11 [Defects Liability] and Clause 12 [Tests after Completion]."	"...damage caused by the Contractor in the course of any other operations (including those under Clause 11 [Defects Liability]."	"...damage caused by the Contractor or Subcontractors in the course of any other operations (including those under Clause 11 [Defects Liability] and Clause 12 [Tests after Completion]."
5	18.4, second paragraph	"The Employer and the Engineer shall also be..."	Same as Yellow.	"The Employer shall also be..."

Table 2: Differences between the new Yellow Book compared to the new Red Book and the new Silver Book – Clause 18 Insurance

No.	Clause No.	Yellow	Red	Silver
1	19.4, last paragraph	"After receiving this notice, the Engineer shall proceed..."	Same as Yellow.	"After receiving this notice, the Employer shall proceed..."
2	19.6, second paragraph	"Upon such termination, the Engineer shall determine the value of the work done and issue a Payment Certificate which shall include:"	Same as Yellow.	"Upon such termination, the Employer shall pay to the Contractor:"

Table 3: Differences between the new Yellow Book compared to the new Red Book and the new Silver Book – Clause 19 Force Majeure

Allocation of risks and their management

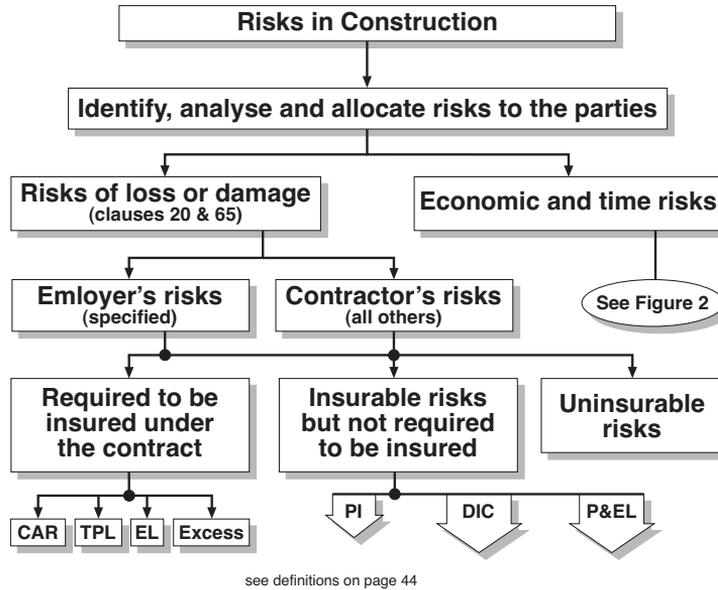
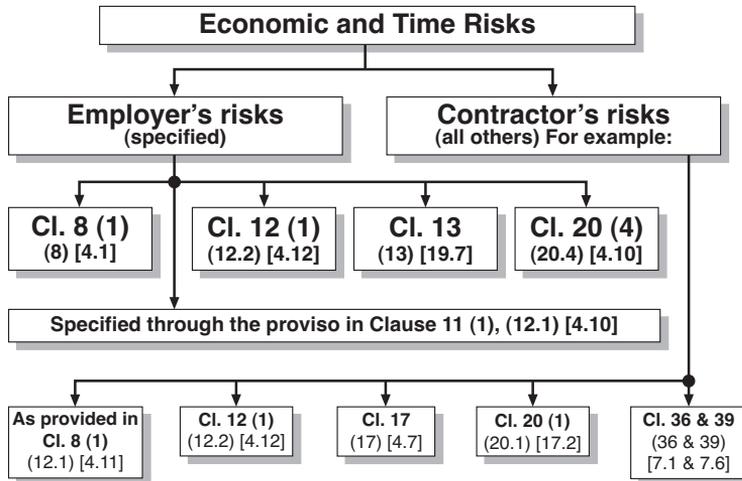


Figure 1: Indemnities and insurances relating to risks of injury and damage under FIDIC's major forms of contract



Numbers in **bold** refer to ICE
 Numbers in *italics* refer to the FIDIC Red Book 4th Edn.
 Numbers in [square brackets] refer to the FIDIC New Red Book 1999

Figure 2: Employers' and contractors' economic and time risks under FIDIC's major forms of contract

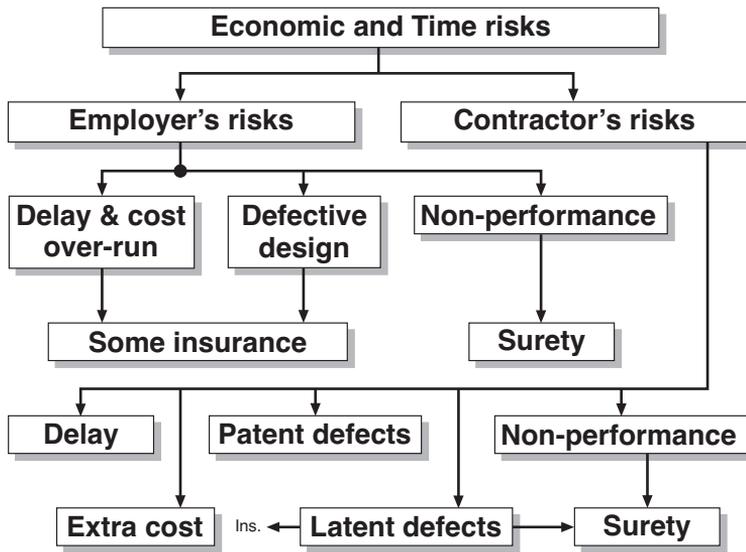


Figure 3: Indemnities and insurances relating to reconomic and time risks under FIDIC's major forms of contract

Notes to the Figures

1 Definitions of insurance acronyms (Figure 1, page 43)

- CAR: Contractor's All Risks
- TPL: Third Party Liability
- EL: Employer's Liability
- PI: Professional Indemnity
- DIC: Difference-in-Conditions
- P&EL: Public Liability and Employer's Liability for the Owner/Employer

2 Copyright Credits

Figures 1 & 3: *The FIDIC Form of Contract*, 2nd edn., 1997, by Nael G Bunni, published by Blackwell Science

Figure 2: *Risk and Insurance in Construction*, 2nd edn., Taylor & Frances Books Ltd, in press

Part 2: Risk and Project Management

Jason Le Masurier

Introduction

This section focuses on the risks that arise as a result of the way a project is managed. This analysis is based on the premise that project management is, in itself, a risk management activity, rather than the commonly held opposite view, that risk management is only one aspect of project management. In particular, the relationships that develop on a project, heavily influenced by the type of contract, can pose a significant risk to the success of a project. Management of these risks relies on a robust feedback process and a technique is proposed, derived from geotechnical engineering, which allows all project uncertainties to be managed in an integrated way.

Cultural and Organisational Risks

The risks associated with adversarial relationships on a project are real, but do not receive the same attention as other risks that are generally covered in a contract. The results when such risks eventuate can be described as ‘Organisational accidents’. Organisational accidents are defined by Reason¹⁰ as accidents that *“have multiple causes involving many people operating at different levels of their respective companies”* in contrast to individual accidents in which *“a specific person or group is often both the agent and victim of the accident”*.

If instead of ‘accident’ we substitute ‘risk’, we can define individual risks as those that are generally covered in the contract, whereas ‘organisational risks’ are those that are inherent to the project culture and can result, in part, from the contract itself. Another way to distinguish the two types of risk is in terms of the ability of the project team and their organisations to directly control them. Individual risks are beyond the direct control of the project players and can generally be allocated under the contract (in Part 1, Bunni sub-divided these risks into insurable and uninsurable). Organisational risks are, in contrast, controllable by the project players and their organisations.

Clearly there is a link between the two types of risk, in that failings in the project organisation or management will create conditions under which individual accidents are more likely to occur. Reason refers to ‘latent conditions’ which *“arise from strategic and other top-level decisions made by organizational managers. The impact of these decisions spreads throughout the organisation shaping a distinctive corporate culture and creating error-producing factors”*.

The Heathrow Express, a link between London and Heathrow Airport, provides a good example of the consequences of organisational risks in construction. In the report on their investigations into the collapse of a tunnel during construction,

¹⁰ James Reason, *Managing the Risks of Organisational Accidents*, Ashgate Publishing, UK, 1997.

the UK Health and Safety Executive (HSE)¹¹ concluded:

“the incident exhibited all the hallmarks of an ‘organisational accident’; that is, a multiplicity of causes led to the position where systems variously used by the client, designers and contractors failed and a major accident adversely affecting the safety of a large number of people occurred. There were undoubtedly human errors, but these were merely a consequence of foreseeable organisational failures. The causes of the incident were rooted in failures in ‘defensive’ systems that did not adequately deal with hazard identification, risk avoidance and reduction, and the control of remaining residual risks.”

A key word here is ‘systems’. We are considering the risks associated with an entire system, whereas the traditional view of risk management focuses on the individual parts of the system; in philosophical terms, the distinction is between a reductionist and a holistic approach. The importance of systems thinking in risk management has been stressed previously.¹²

Measurement of Risk

Risk is defined as the product of probability and consequence. If a culture of conflict is considered to be a failure in an organisation, when we refer back to the 1980s and early 1990s in the UK construction industry, the prevalence of confrontational relationships suggests that organisational accidents were almost a certainty on construction projects procured under the lowest bid system. The common occurrence of contractual claims, and occasional associated litigation, provides further evidence of the likelihood of organisational risks eventuating under unfair contractual relationships.

The consequences of organisational accidents vary. One consequence, as discussed by Stockman¹³, is the adverse effects on the health of the people involved in the project. In extreme cases the consequence of organisational accidents can be catastrophic project failures and/or company bankruptcy, as the Heathrow Express project and the Kariba Dam project demonstrate (see Chapter 10).

In terms of the categories of loss given by Bunni in Part 1, the losses associated with organisational accidents come high on the scale. Cost overruns on adversarial construction projects, which can be attributed to ‘organisational accidents’, have been commonly 10%-20%, and sometimes much more, putting such ‘accidents’ into category 5-6 on Bunni’s scale. There was, and in some cases still is, a certain inevitability with such project cost overruns, so failures of projects in this way were not recognised as ‘accidents’. Major failures, such as the Heathrow Express and Kariba Dam, would be more easily recognised as accidents, in category 10 on Bunni’s scale.

¹¹ Health and Safety Executive, *The collapse of NATM tunnels at Heathrow Airport*, HMSO, London.

¹² David Elms, “Risk Management - General Issues” in *Owning the Future: Integrated Risk Management in Practice*, Centre for Advanced Engineering, Christchurch, 1998.

¹³ see Chapter 8.

When one considers the lengths taken to mitigate far lesser risks through contracts, the benefits of considering organisational risks in the same way as individual risks becomes apparent. The rewards from preventing an organisational failure can be much greater, for example, than the rewards from mitigating project delays – typically, far more energy is spent on the latter than the former.

Managing Risks through Contracts

The role of the contract in risk management is covered in Part 1 and extensively throughout the book, but it is worth noting here in the context of organisational risks, the key influence of the contract. A fair contract can be a contingency plan, providing a basis for equitable sharing of risks and, for example in the NEC, detailing the processes required to resolve differences between the parties. Conversely, an unfair contract can itself be a major hazard to the project. Contracts that seek to protect the project owner from every individual risk will expose the project and ultimately the owner to greater organisational risks due to the engendered animosity. This is a concept also presented by Reason (see footnote 11) under the heading of ‘*dangerous defences*’:

“Defences designed to protect against one kind of hazard can render their users prey to other kinds of danger, usually not foreseen by those who created them, or even appreciated by those who use them. In short defences can be dangerous.”

Once the concept of organisational risks has been accepted by a project team, then subsequent risk assessment would include assessment of the likelihood and consequence of a breakdown in communications and cooperation between the parties on the project and development of mitigation measures. This aspect is developed in the next section.

Managing Risk by the Observational Method

The Observational Method is an example of a particularly effective reaction to the concept of ‘dangerous defences’, as discussed above, practised in some sectors of geotechnical engineering for many years, which provides a model that can be applied to the management of a diverse range of risks on a project.

Ground conditions account for the largest element of technical and financial risk in civil engineering projects.¹⁴ Uncertainty in the ground conditions derives from a lack of knowledge of both the exact location and the mechanical properties of all the geological materials present on the site. Faced with this uncertainty, the common approach, known as ‘predefined design’, is to attempt to eliminate the uncertainty by assuming the worst possible conditions, derived from the data available prior to construction.

¹⁴ Whyte, I L and Tonks, D M . (1994), “Project risks and site investigation strategy”, in *Risk and Reliability in Ground Engineering* (ed. B O Skipp), Thomas Telford, London.

This conservative approach is a 'dangerous defence' since the project progresses on the basis that every eventuality is covered, leading to complacency, which may be shattered if ground conditions transpire to be even worse than the designer's assumed 'worst possible'. Hence, predefined design leads to poor value, either solely due to the wasted resources of over design or with the additional extra costs of dealing with 'unforeseen ground conditions'.

A number of designers have recognised the inadequacies of predefined design and applied a more pragmatic approach, managing the uncertainty using the Observational Method, as defined by Peck.¹⁵ This approach recognises that uncertainty has two components, risk and opportunity — i.e. the ground conditions could turn out to be better than expected, or worse.

An Observational Method design is based on the assumption that the ground conditions will be near the average of the predicted conditions, but alternative designs or contingency measures are prepared in case conditions should turn out to be worse than predicted. During the design implementation a rigorous monitoring and observation strategy is used to check and confirm the actual conditions found during construction. Performance indicators are selected for monitoring, related to the critical risks. For example ground settlement may be monitored when loading on the ground is increased or during adjacent excavations.

In the light of the information on the actual ground conditions gathered during construction, the design can, if necessary, be modified in a timely way, either to take advantage of better than expected conditions or to avoid problems which might develop due to worse than predicted conditions. The main advantage of this approach is the 'finger on the pulse' from monitoring, which means there should be no surprises.

To ensure success of such a flexible design approach, the processes of design and construction need to be integrated and close co-operation is required between all those involved in the design and construction process. This brings us back to the project culture discussed earlier, since project relationships based on trust and cooperation are even more important when using an Observational Method than with a predefined design.

The Heathrow Express project mentioned above illustrates this point very well. The New Austrian Tunnelling Method (NATM) used to construct the project tunnels is a variant of the Observational Method. The basic steps are to excavate the tunnel, install a primary lining and then monitor movements in the tunnel walls. If movements are within acceptable limits then no further support is required, but if excessive movements are detected then additional support is installed. Progressing in this manner, efficiencies can be made by tailoring the lining to suit the actual conditions found and by modifying the excavation sequence.

¹⁵ Peck, R B (1969), "Advantages and limitations of the observational method in applied soil mechanics", *Geotechnique* 19 (2).

The initial impression may be that this is less safe than the predefined design approach, particularly in view of the collapse of the NATM tunnels at Heathrow. However, the NATM and Observational Method are inherently safe when carried out correctly, since the monitoring will give early warning of problems, allowing contingencies to be implemented in a timely way. Of course, there is an overriding proviso that contingencies are able to be mobilised in time, so, for example, this approach is not applicable when failure mechanisms are brittle.

The HSE investigations into the collapse of the tunnels at Heathrow (footnote 11) vindicated the NATM but found that it had not been applied correctly:

“The design economies meant that greater care was needed during construction and monitoring. However the design did not fully specify what monitoring regime was required nor set out predefined trigger levels and the design did not fully consider what contingency actions might be required to secure continued stability in the event of difficulties during construction.”

In fact there was plenty of monitoring being done, but due to the contractual pressures on the people involved, the impending collapse was not detected. Analysis of the data during the HSE investigations showed that signs of the developing failure were present weeks prior to the actual collapse. The role of the contractual arrangements in contributing to the collapse are summarised in Box 1.

As highlighted earlier, the failure of the tunnel at Heathrow was described by the HSE as an ‘organisational accident’. The project team had suffered a severe failure but the same people were able to overcome the problems and through a culture change exercise, documented by Lownds¹⁶, they went on to establish a benchmark for collaborative working in construction, and, despite the severe setbacks, delivered the project only nine months late. A contribution to the post-collapse success was the use of an Observational Method design for the recovery work excavations.¹⁷

This begs the question: How did the same team fail so spectacularly to manage the risks using NATM prior to collapse and then use the same risk management approach, the Observational Method, so effectively subsequent to the collapse? The answer lies in the culture change.

A key point illustrated by the Heathrow Express project is that, when using an Observational Method, the behaviour of the project team is a greater risk to the project than the ground conditions. The author has carried out research into the Observational Method process¹⁸ and developed a model that allows an

¹⁶ Lownds, S (1998), *Fast track to change on the Heathrow Express*, Institute of Personnel and Development, London.

¹⁷ Powderham, A J and Rankin, W J (1997), “Heathrow collapse recovery solution cofferdam - planning design and implementation”, in: *Proceedings of International Conference on Foundation Failures, 1997*.

¹⁸ Le Masurier, J W (2001), “Developing the Observational Method as a systemic approach to uncertainty management”, PhD thesis, University of Bristol, UK.

Box 1: Results of the investigation into the Heathrow Express tunnel collapse (see Footnote 11)

The Contract

The contractual arrangements involving the assignment to the contractor of the process risks from using the NATM and settlement control, the self-certification of quality, and the separation of the design of the permanent and NATM works meant that the parties had to deal with a number of significant issues.

The chosen approach substantially transferred the process risks connected with the use of new technologies from the client to the contractor and this limited the opportunities for direct intervention by the client team.

To some degree there was a contradiction in the contractual approach. The client chose to let the contract through a traditional competitive tender but had the expectation that self-certification, a cutting-edge approach more closely aligned with new forms of contracting, would provide for quality. Likewise, the advantages accruing from greater integration of the temporary and permanent works design were lost. The contractual arrangements meant that the two designs were separately developed by the two design teams.

Breaking the link between the design of the permanent and temporary (i.e. NATM) works created difficulties in taking an integrated design approach to risk reduction. The separation reduced the permanent works designer's interest in the impact that the permanent works had on the temporary works; and, likewise, it limited the temporary works designer's ability to influence the permanent design.

integrated approach to the management of all project risk, as described in the next section.

A New Approach to Uncertainty Management Afforded by Collaborative Working

Whilst the Observational Method is recognised as a particular approach to geotechnical design, as discussed in the previous section, it is in fact generic, based on the feedback loop shown in Figure 1, and people use this method instinctively to manage uncertainty in everyday life — driving a car for example.

The basic principle is that in any process where there are uncertainties, the most efficient way to manage the uncertainties is by monitoring performance of the process, considering options and taking corrective action when necessary. The alternative approach, commonly used in construction, is to try and eliminate uncertainty.

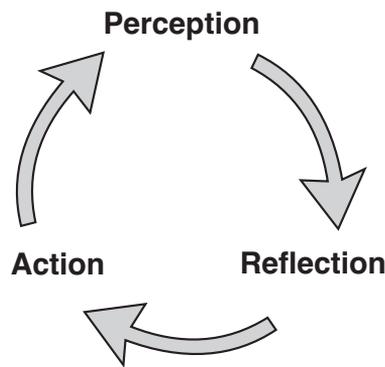


Figure 1: Basic feedback loop for managing uncertainty

Extending the observational method model to the generic case, the performance indicators chosen for monitoring will be derived from the objectives of the process. In the geotechnical case the objective may be to limit settlement. In other cases the objective may be to limit environmental impact or to delight the customer. Many projects will have a whole range of interrelated objectives, which could include, for example, the three just mentioned. The model proposed by the author, referred to as ‘observational engineering’, is one that allows all project objectives and uncertainties to be managed in an integrated way.

In any construction process, behaviour of the project team members is a significant uncertainty and, therefore, in observational engineering, performance of the team would be monitored and used to provide feedback to the members — for example ‘team spirit’ could be a key performance indicator. Measuring these ‘soft’ performance indicators is clearly more difficult than the traditional physical measurements, as used in geotechnics, but it is precisely these human factors that are crucial for success, as illustrated by Heathrow Express. Interest is increasing and progress is being made in measuring such ‘soft’ indicators in the construction industry¹⁹, for example using questionnaire techniques.

The observational engineering methodology is based on applying the principles of the Observational Method at various levels — at the traditional level to manage uncertainties in the ground and at the organisational level to manage human uncertainties. Since clarity and agreement over roles and responsibilities are crucial for success, processes need to be designed by all involved using process models, ensuring contingency plans for all project scenarios are in place from the start. The process models are thus an integral part of the process; if there is a mismatch between the actual process and the model, either the model needs to change or the actual process needs to change — in either case the agreement of the team is required.

¹⁹ see for example Demonstration Project 120 and 225 at www.m4i.org.uk

The observational engineering model is shown in Figure 2 and explained as follows. Starting at the bottom of this picture, observational engineering is founded on a cohesive project team. The project team collectively agree on and work towards a set of common project objectives; the team then design the processes required to reach the objectives and capture these in a process model. A range of performance indicators, based on the project objectives, is associated with each of the project processes, shown at the top of the picture. The actual values of these performance indicators are monitored as the project progresses and reviewed against a set of trigger value criteria. The data are fed back to the project team to inform their actions within the continuing project progression. The team carry out regular reviews that may result in modifications to the project objectives and/or the project processes.

Contingency plans need to be in place, ready to be implemented if the project deviates from its path to success. Examples of contingency measures for the ‘soft’ organisational risks, employed from the start on some partnering projects, include open book accounting to instil trust, co-located offices to improve cooperation and communications, incentives for all parties to identify opportunities and savings and the employment of experienced facilitators to promote teamwork.

Some may say observational engineering is ‘common sense’, but so often in

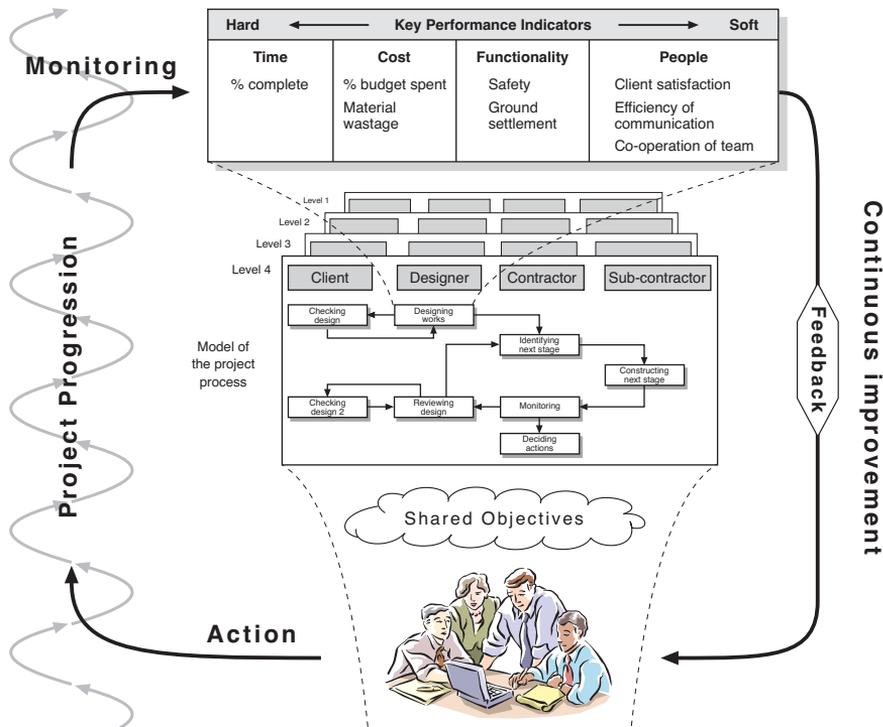


Figure 2: Observational Engineering model

construction this concept is not applied and, rather than progressively reduce uncertainty through continuous feedback, attempts are made to hide, ignore or eliminate uncertainty, or transfer responsibility for it to another party. When a collaborative culture exists on a project, with amicable arrangements for sharing the risk and reward associated with project uncertainties, then realistic assessments of uncertainties are possible.

Since observational engineering recognises there is both opportunity and risk associated with uncertainty, in order to be successful it must be applied under contract terms that integrate the two; i.e. contracts that share risk and reward fairly among the parties. In this situation, all parties have an incentive to sign up to the process from the start and work towards common objectives. It will not work under one-sided contracts that seek to separate risk and reward at the start of the project. The problem with such contradictory contractual requirements is clearly illustrated in the example in Box 1.

Establishing the Culture

As the Heathrow Express example illustrates, the project culture will be determined by the particular contractual circumstances. Before the tunnel collapse the cultural mind-set focussed attention on the apparent economies and the need for production, rather than on particular risks. After the collapse the team became united in their objective to overcome the failure. Often a crisis can have this effect of uniting previous adversaries (see also footnote 20). The question that follows this observation is: Why wait for a project crisis to establish the favourable culture, why not establish it from the start?

This question resonates throughout the book. For example partnering may be established from the start of a project or develop when a need is felt among certain parties (see Chapter 8). The parties engaged to resolve disputes can be appointed from the start, or can be appointed once a dispute has arisen (see Chapters 9 and 11). In all situations, the better result is obtained if the relationships and culture are established by design, from the start, rather than developing in response to a set of circumstances.

In this regard, the project owner has the greatest power to manage the risks of organisational failures, through the method of procurement, choice of contract form, equitable assignment of project risks and active promotion of a team approach to project delivery, a point also made by Tuohey in Part 3.

Providing a project has been set up under contract conditions that seek to manage the risks of organisational failure, it is the responsibility of all parties to ensure that a cooperative culture is maintained. The greatest responsibility rests on those at top levels of management, who should lead by example.

²⁰ In the original paper on the Observational Method, Peck noted that the method is far more often applied as a 'best way out' rather than 'ab-initio'.

Part 3: The Use of Risk Management Processes in Construction Contracts

Patrick Tuohey

Introduction

Everyone is familiar with the management of risk — we all do it every day. However, the formalised approach to risk management in a project environment is relatively recent. The advent of the Australian and New Zealand Standard AS/NZS4360:1999 has provided an accepted framework and methodology for the management of risk across an entire enterprise. In relation to the development and implementation of contracts in the engineering and construction industry, a formalised approach to risk management can provide for an ‘optimum’ contract form — one in which the risks are carried and hopefully managed by the party most able to control and influence the outcome of the potential hazard of the risk event.

This paper describes the risk management process inherent in AS/NZS4360:1999, looks at how the process can best be used in the development and implementation of contracts in the engineering and construction industry, and examines how these processes are currently being employed in the resources sector in Australia and elsewhere.

Australian/New Zealand Standard 4360:1999

The Australian/New Zealand Standard 4360:1999 defines Risk Management as “... a generic framework for establishing the context, identification, analysis, evaluation, treatment, monitoring and communication of risk.” The Standard is not prescriptive, but rather describes the systems and processes required for risk management in any field of endeavour. The use of AS/NZS4360:1999 as an integral element of ‘good management practice’ across an enterprise, and in particular in matters relating to corporate governance, makes the Standard an ideal choice as the framework for project risk management. It means that a uniform, structured system can be used across an organisation, and that corporate management can better understand risk issues on individual projects, as well as across all projects.

The Risk Management Process

In a formal workshop session, the key project and other relevant corporate players are assembled to identify the risks to the project’s success. The initial workshops are conducted as early as possible in the project life cycle, and follow-up workshops are conducted at regular intervals.

The process concentrates on a qualitative assessment of the project risks, and the development of a Risk Management Plan to manage and control these risks.

The process involves the following steps.

- Establish the Context
 - the formal description of the context under which the risk session will proceed: a written statement is agreed up-front by the players on the precise purpose of the session.
 - the identification of the key stakeholders in the project: typically, the key stakeholders encompass a much broader group than the direct contract holders.
 - the identification of key success factors for the project and of the needs of the key stakeholders: by definition, a risk is anything that impacts on these.
- Identify Risks
 - a brainstorming session in which all possible project risks are identified and logged, without reference to any evaluation criteria — an ‘anything goes’ forum. It is recognised that no single party is the fountain of all project knowledge, and every participant has useful information to add to the forum.
 - as a safety net under the brainstorming session, a series of key-word checklists are presented to the session to uncover additional risks.
- Analyse Risks
 - the risks identified are now categorised into broad ranges, based on a consequence-likelihood matrix against criteria — numerical ranges are used for both the consequence of a risk occurring, and the likelihood of it occurring.
- Evaluate Risks
 - the risk matrix provides a severity ranking of each risk into (a) extreme; (b) high; (c) moderate; and (d) low categories. Generally, extreme and high risks require immediate attention, while moderate and particularly low risks may be accepted without treatment.
- Treat Risks
 - for extreme and high risks, a treatment plan is established in order to mitigate the risk. Possible ways to treat risks include (a) reduce the consequence of occurrence; (b) reduce the likelihood of occurrence; (c) reduce both the consequence and likelihood; (d) transfer risk to another party; (e) avoid risk; and (f) accept risk.
 - as an outcome of the risk treatment plan, a risk action plan is agreed describing the required action, action parties and schedule for action completion. It is crucial to ensure that the team does not attempt to solve all the issues at

this forum — there is generally a tendency in this direction. Rather, the key focus is for the team to imagine ways in which a risk may be treated, and to devise possible actions. A later investigation by the project team will determine if a proposed action is indeed beneficial and cost-effective.

- Communicate and Consult
 - the Risk Management Plan is communicated throughout the project team, to get buy-in and agreement at all levels.
- Monitor and Review
 - the Risk Management Plan becomes an on-going strategic project management tool, and is kept alive throughout the performance of the project.

The Risk Management Process in Contract Formation

All contracts are vehicles for the allocation of risks between the contracting parties. Contract negotiation is a process for the allocation of risks. At any given time in the project development cycle, there is a discrete, yet generally indeterminate, quantum of risk. For every potential hazard to the achievement of the desired outcomes of a project, there is a risk premium — the amount of money that a party (including third parties, such as insurers) is prepared to be paid for taking on that risk. The theoretical optimum allocation of risk in a contract is that point where the sum of the risk premiums is minimised — where each party takes on the risks for which it is best placed to control and manage those risks.

The risk management process described above provides the forum for parties to jointly identify and evaluate the risks to a project, and subsequently to allocate those risks in an efficient manner. A risk allocation matrix is typically used to document this process, whereby the risk events, the proposed controls and the responsible party are tabulated for all risks identified. Ideally, such a process provides an analytic forum in which the negotiation process can be undertaken, largely divorced from emotional factors. There is a significant body of literature in this regard (for example, see footnotes 21 and 22).

Current Practice in Contract Formation

While the theoretical position is well established and generally understood, how does industry actually perform against the optimum risk target? A recent report by the Victorian Government²³ gives some interesting insights into the strategic decision-making by various parties in the allocation of risk in public projects.

²¹ Zack, James G, “Risk Sharing - Good Concept, Bad Name”, *AACE Transactions*, 1995.

²² Jergeas, George F and Francis T Hartman, “A Contract Clause for Allocating Risks”, *AACE Transactions*, 1996.

²³ Victorian Government, Department of Treasury and Finance and the University of Melbourne, Department of Civil and Environmental Engineering, *Private Provision of Public Infrastructure: Risk Identification and Allocation Project*, 1999.

A factor which tends to defeat the efficient allocation of risk in construction contracts is that the Principal (or Owner, Employer, Company, etc) may have significantly more power at the contract formation stage than does the contractor. This power derives from (a) the competitive bidding process, with unreasonable time pressures on the contractor and often involving a large number of bidders; (b) in-house risk management and legal expertise which greatly exceeds that of the contractor; and (c) a general reluctance (perhaps born of ignorance) by contractors to price adequately for the risks they are being asked to take on. However, who is the winner in this power game? At first glance one might be tempted to believe that the Principal will always win. However, history shows that when projects fail, all parties are liable to be affected detrimentally. For example, if a Principal is stuck with a poorly-performing process plant, its economic performance will be inhibited long after the project (and perhaps the contractor) is finished.

The joint use of formalised risk management processes provides all parties with a way out of this bind. Indeed the author has been involved in a number of contract negotiations where the use of the formalised risk management processes described here has resulted in a revised contract form of significantly greater benefit to both contractor and Principal.

However, such occurrences are still unusual. Most contracts are drafted unilaterally by the Principal, and risks are allocated without the benefit of these risk management processes. Some of the more common approaches are as follows.

Large, multinational companies

Despite a good understanding and a general utilisation of the principles of risk management processes, there is an increasing tendency for large, multinational operating companies to draft one-sided contracts with an inordinate and inappropriate concentration of risk placed with the contractor. In subsequent negotiation, the representatives will use phrases such as “*your competitors are prepared to accept these conditions*” and “*trust me, our legal people need to have these terms, but the project team will never use them*”. A recent draft contract reviewed by the author required the contractor to take responsibility for consequence damages, including the cost of delays to production — a position no contractor could ever accept. One wonders if such an approach by the legal departments of large companies is producing tender prices which are elevated across the board.

Privately funded projects

Many major resource industry projects in Australia are promoted by smaller corporate owners, using project-specific financing from banks and other financial institutions. This leads to the financiers having a major input to the forms of contract, possibly without an understanding of the complexities of the technical factors of the project. Banks seem to have a curious attitude to risk — it is

essentially a problem for someone else. There appears to be little incentive for the financial institutions to seek optimum risk allocation. As would be expected, such an environment produces high risk premiums from contractors, and consequently inefficient project outcomes.

Lump sum EPC projects

In the resources industries, particularly in South East Asia and the Middle East, there remains a tendency for major projects to be executed on a lump sum, Engineer/Procure/Construct (EPC) basis. This can be an effective basis, so long as there is adequate definition in project scope, and adequate time for contractors to prepare prices. However, in many projects, lump sum EPC is used as the basis, without enough up-front definition of the project, and consequently with a large amount of change being required during the project execution. As would be expected, such an environment is a recipe for disaster for all parties. Indeed, there are recent reports that a number of the world's largest engineering contractors (among those who remain solvent) have made strategic decisions to avoid lump-sum EPC work. Time will tell if this is a temporary adjustment only, or if more enlightened contract models will evolve.

Alliance model

Over the past ten years, there has been a major push into the development of alliance-type contractual relationships, both for major projects and for on-going engineering and construction maintenance and minor project activities. A key factor driving this push was the Cost Reduction in the New Era (CRINE) initiative emanating from the offshore oil and gas industry in the North Sea. In alliance-type contracts there is a genuine attempt to find the optimum risk allocation within the project, with a particular focus on the alignment of economic goals between the parties, so that everybody wins when the project wins, and everybody hurts when the project fails.

In practice, there have been a number of issues in the execution of alliance-type contracts, as follows: (a) the risk/return ratio can be such that the rewards to the contractor are low, particularly if the contractor is required to have some of its key people tied up in the alliance for extended periods; (b) the integrated team environment can be quite stressful for people; and (c) the nature of long-term alliance contracts is that there is one winner only, with the consequence that there is the potential for competition in the market to be reduced, particularly in thin markets like Australia.

Overall Project Risk Management

The contract is a crucial and important document for a project, ideally describing accurately and clearly the agreed risk allocation between the parties. It should help to drive the performance of all parties in the direction of a successful outcome. However, the risks to a project go beyond the terms and conditions of the contract

binding the main parties. For example, major risks typically assumed by the contractor such as labour disputes, escalation of costs of labour and materials and delayed delivery of long-lead items, are often those areas where the real effort in project management needs to be extended. Similarly, risks to the Principal such as product market conditions, regulatory approvals and management of stakeholder expectations, are critical areas outside of the contract where constant attention needs to be maintained to achieve a successful project.

In recent years, there has been a significant drive to develop processes for overall project risk management, taking a holistic view of the dangers to the achievement of successful project outcomes, and developing formalised structures for managing those risks. As described above, the process that Worley uses is based broadly on AS/NZS 4360:1999, fast becoming an international standard in risk management. The process is also consistent with project-based risk management processes, such as Risk Analysis and Management for Projects.²⁴ Additionally, there are many excellent publications which present processes and procedures for the management of project risk. For example, the works of Chapman²⁵ in this area have been extremely useful.

In Australian government agencies, it is now a common requirement for the tenderer to include with his tender a draft risk management plan for the entire project — it is easy to believe that in the near future, risk management will become a necessary, formal process in the execution of all projects. Projects will be more likely to succeed as a result.

Conclusions

Formalised risk management processes such as those proposed by AS/NZS 4360:1999 provide an advanced technique for the identification, evaluation and treatment of project risks. This process can then be used for the development of an efficient contract form, based on the allocation of risk to the party best suited and able to manage and control the risk. While there is some evidence of the successful use of these principles, the resources industries still tend to use contract models which deviate from the theoretical optimum. However, the same risk management processes are being used to develop a holistic treatment of risk across an entire project, and this trend is expected to improve project performance.

Examples of Worley's Project Risk Management process are given in Appendix A, page 291.

²⁴ Institution of Civil Engineers and the Faculty and Institute of Actuaries, *Risk Analysis and Management for Projects (RAMP)*, Thomas Telford, London, 2000.

²⁵ Chapman, Chris and Stephen Ward, *Project Risk Management – Processes, Techniques and Insights*, John Wiley and Sons, Chichester, 1999.

5

The New Suite of FIDIC Conditions of Contract: Significant Changes

Nael G Bunni

Abstract

In September 1999 the International Federation of Consulting Engineers (FIDIC) issued a new suite of Conditions of Contract. It was not just an update of the 4th Edition of the Red Book and its companion forms for other types of project. The new documents departed from the traditional style and structure, inherited from the Conditions of Contract of the Institution of Civil Engineers, London. The clauses of the four principal contract forms of the new set had now been drafted to suit the design approach followed: whether the design would be carried by the Employer, by the Contractor, or whether the project would be developed as a turnkey contract.

The new suite contains several other departures from the traditional conditions of contract: the language is simpler, and certain concepts that previously had to be consigned to the Conditions of Particular Application (Part II) have been brought into the core text. Also, and most importantly, whilst the Engineer remains as an *option* in the traditional role of decision maker and impartial primary adjudicator in disputes, the core text of the Red Book clearly identifies him or her as a servant of the Employer, with contract supervision functions as a delegate of the Employer. The primary role of impartial resolution of problems and disputes is now given to a neutral person or panel: the Disputes Adjudication Board.

Nael Bunni (himself a member of FIDIC drafting committees) reviews the new suite of Conditions of Contract and points out the principal areas where they differ from the past issues of the FIDIC document. Readers should refer to the 4th Edition of the Red Book ("FIDIC 4th", first issued 1987, amended in 1988 and 1992, and issued with a supplement in 1996) as the principal *traditional* form of construction contract to which the comparison refers. Nael Bunni also points out certain problems of drafting that must be borne in mind by any user of the new documents.

Readers familiar with the international development banks' Standard (or Sample) Bidding Documents (SBDs) should note that the current editions of these documents still include FIDIC 4th (with the revisions of 1992) as the basic Conditions of Contract. The multilateral development banks are working on production of harmonized standard documents. The first such document is expected to be a Master Pre-qualification document, programmed to be issued in September 2002; concurrently, work is being done on drafting a harmonized SBD for Works. The drafting work includes consideration of whether to include the new FIDIC documents in the harmonised SBD¹.

¹ JJ Raoul, the World Bank, 21 May 2002

Introduction

In September 1999, the International Federation of Consulting Engineers, 'FIDIC', published a new set of standard forms of contract alongside those that had been in use at that time. The new set is made up of the following four contract forms:

- **The Green Book:** The Short Form of Contract — Agreement, General Conditions, Rules for Adjudication and Notes for Guidance;
- **The New Red Book:** The Construction Contract, (Conditions of Contract for Building and Engineering Works, Designed by the Employer) — General Conditions, Guidance for the Preparation of the Particular Conditions, Forms of Tender, Contract Agreement, and Dispute Adjudication Agreement;
- **The New Yellow Book:** The Plant and Design-Build Contract, (Conditions of Contract for Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by the Contractor) — General Conditions, Guidance for the Preparation of the Particular Conditions, Forms of Tender, Contract Agreement and Dispute Adjudication Agreement; and
- **The Silver Book:** The EPC & Turnkey Contract, (Conditions of Contract for EPC Turnkey Projects) — General Conditions, Guidance for the Preparation of the Particular Conditions, Forms of Tender, Contract Agreement and Dispute Adjudication Agreement.

Unlike the standard forms of contract that had been in use prior to September 1999, which were distinguished from each other on the basis of the type of project to which they applied, the new forms are distinguished on the basis of the allocation of the design function.

It is because of this new distinguishing characteristic that the New Red and New Yellow Forms were not given a different colour, as FIDIC wished them to be identified by their respective function of design rather than by their colour. However, despite FIDIC's wish, these documents are more easily identifiable by their colour with the added tag of 'old' and 'new' and the past few years since their publication date have proved that assertion.² In any case, it is important to remember that, although the new Forms of Contract have retained many of the principles and concepts of the old Forms, the differences between them are too great to make the new set a revision of the old. These differences are too numerous in format and in concept and the New Red and New Yellow Books are not revisions of the old Red and Yellow Books.

The New Red, New Yellow and Silver Books have been drafted with the same format and to a large extent their text is similar in its wording. The draftsman, however, pursued this desire for similarity in wording too far in certain instances,

² It is indeed a pity that these new Contract Forms were not given new colours, which would have eliminated the need for the added tag of 'old' and 'new'. The drafting committee was advised to that effect by many correspondents, but chose to ignore the advice.

and thus has caused problems that should become obvious on close scrutiny.³ The format adopted for these new Forms of Contract is that of the Orange Book, which had been published in 1995 for use in Design-Build and Turnkey projects. The Orange Book is now obsolete, as it has been replaced by the New Yellow Book.

The Silver Book is totally new and to a large extent forms a departure from FIDIC's established position of providing forms of balanced risk allocation. The risks in the Silver Book are mostly allocated to the contractor. The Green Book is also a new venture for FIDIC in that it is intended for smaller contracts of less than US\$0.5 million. Whilst the changes in format may not be sufficient to influence one's choice between the old and the new forms, the 18 significant changes in concept would. These changes in concept will be discussed below and this chapter will also review the logic and rationale behind the major changes.

Accordingly, it is appropriate to consider first the New Green Book and then deal with the three new major Forms of Contract. It is also appropriate to consider the New Red Book and the New Yellow Book together, leaving the Silver Book to be discussed on its own. Finally, having considered the significant changes, a set of conclusions is drawn as to the value of these new forms of contract.

The New Green Book

The Green Book, as stated in its Forward, is intended to be used as a form of contract for engineering and building work of fairly simple or repetitive work of short duration with relatively small capital value,⁴ but it may be suitable, subject to the type of work and circumstances, for contracts of greater value. The objective of the Green Book is for the Contract to express in clear and simple terms traditional procurement concepts.⁵

Furthermore, the form is drafted in a flexible format that includes all essential commercial provisions and a variety of administrative arrangements. Thus, it is envisaged that the employer may provide the design himself, by others on his behalf, or by the contractor in a design/build format. In the latter situation, tenderers would be required to submit a design with their tenders, which would be governed by the provisions of clause 5 of the Green Book's Conditions, "*Design by Contractor*".

It is also envisaged that in the Green Book there would be no traditional "*Engineer*" or "*Employer's Representative*" in the formal sense used by FIDIC in most of its other forms of contract. Instead, the employer takes over the functions usually performed by the Engineer or the Employer's Representative. However, the employer may appoint an independent engineer to act impartially by modifying clause 3 of

³ For example, with the variations in the design function between the three new major Forms of Contract, there should be different insurance requirements set out independently for each of them. Furthermore, the requirements in turnkey projects demand as a prerequisite the provision of additional insurance policies.

⁴ As stated above, it is suggested that the intended capital value is around US\$0.5 million.

⁵ See the first line of the Notes for Guidance, which forms the last section of the Green Book.

the Conditions “*Employer’s Representative*”.

These various options are explained at the end of the Green Book in a section entitled “Notes for Guidance”, which do not form part of the Contract.⁶ Accordingly, once the employer considers the options available to him under the Green Book, he is guided to select what he needs and deletes what he does not, ending in a contract form which crystallises his choice. The employer is then directed to complete an appendix, which incorporates the characteristics of his chosen contract, prior to inviting tenders. This appendix appears at the beginning of the Green Book as part of the Agreement, which will be eventually signed with the selected contractor.

The flexibility of the document is a significant feature of the Green Book, particularly where insurance is concerned. This is because the relevant clause, clause 14, only specifies the general framework of the cover required, leaving the various details to be completed by the employer in the Appendix with extensive freedom to include any insurance requirement and in any detail he deems fit.

Having explained the general aspects of the Green Book, it is important to draw attention to a serious problem with this new form of contract. It relates to its mishandling of the topics of “*Risk*”, “*Responsibility*” and “*Liability*”. In clause 13, which is the relevant clause to the first two of these topics, we find no mention of risk at all. In fact, other than in the title, the word “*Risk*” does not appear anywhere in the Green Book. But, on close scrutiny, it becomes apparent that the reference to an “*Employer’s Liability*” in the second paragraph of clause 13 is intended to lead the reader to clause 6 of the form, where for some inexplicable reason the draftsman refers to risks as liabilities.⁷

It must be said in this context that it is extremely peculiar that FIDIC, which pioneered the adoption of the risk concepts in its various forms of contract,⁸ is now turning the clock back with its Green Book and confusing risk with liability. Even from a linguistic point of view, it is difficult to understand how one could confuse risk with liability. They are two terms which are entirely different etymologically, scientifically, legally and in every other sense. Risk is technically defined as “*A combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequences of the occurrence*”.⁹

⁶ Unlike FIDIC Contracts Guide for the major forms of contract in FIDIC’s 1999 Suite, which was published separately during 2001, but was copyrighted in 2000, the Notes for Guidance of the Green Book were given in the last section of the book itself.

⁷ This part of the paper is based on an article by the author, which is to be published in the International Construction Law Review in Part I of the 2002 Volume.

⁸ The third edition of the Yellow Book and to some extent the fourth edition of the Red Book, both of which were first published in 1987, were the first forms of contract that recognised the natural flow of risk to responsibility to liability to indemnity to insurance. See in this connection, Nael G Bunni, “The FIDIC Form of Contract – 4th Edition”, Second Edition, Blackwell Science, 1997.

⁹ British Standard No. 4778: Section 3.1 - Guide to concepts and related definitions: 1991. The British Standards Institution, Linford Wood, Milton Keynes, MK14 6LE, UK. In the same British Standard, the definition of ‘hazard’ is given as “*A situation that could occur during the lifetime of a product, system or plant that has the potential for human injury, damage to property, damage to the environment, or economic loss*”.

Liability, on the other hand is defined as *“the legal concept of one party being subject to the power of another, or to a rule of law requiring something to be done or not done. This requirement to do something or not to do it can be compelled by legal process at the other party’s instance. It is sometimes called subjection.”*¹⁰ Liability may arise either from a voluntary act or by force of some rule of law. Thus, a person who enters into a contract becomes liable to perform what he has undertaken, or to pay for the counterpart performance, or otherwise to implement his part of the bargain.

Even if it were not wrong to use the term ‘risk’ and mean ‘liability’, and in the writer’s view it is wrong, the substitution of ‘risks’ with ‘liabilities’ is a detrimental step. The topics of risk and risk management are now part of a respected field of science and their principles should be strengthened and enhanced rather than diluted in any contract.

Moving on to the second paragraph of clause 13.1, the text presents us with an equally serious problem and that is in respect of the gap created by the division of risks (referred to as liabilities), between the employer and the contractor. The employer is allocated the risks described in clause 6. The contractor is allocated the risks of all loss or damage happening to the Works and of all claims or expense arising out of the Works caused by *“a breach of the Contract, by negligence or by other default of the Contractor, his agents or employees”*.

To whom then are the other risks allocated? The risks referred to here are the risks that do not qualify within the meaning of an *“employer’s risk”*, nor can they be described as *“a breach of the Contract”* by the Contractor. This problem is of a similar nature to that created in the three major forms of contract published by FIDIC in 1999 through their Sub-clause 17.1(b)(ii) where the basis of indemnity is negligence rather than legal liability.¹¹ This gap in risk allocation ultimately creates a gap in the insurance cover for the project, unless it is specifically dealt with in the Appendix.

It must be said, however, that grouping in one clause, clause 6, all the Employer’s Risks (provided they are properly identified as risks), including those that lead to pure economic and/or time loss together with the others that lead to loss and/or damage is a good idea.

This idea of grouping all the employer’s risks in one clause is now adopted in the latest of the published FIDIC’s forms, the Form of Contract for Dredging and Reclamation Works, published in 2001, which has fortunately resolved the problem of the confusion between ‘risk’ and ‘liability’. Thus, for anyone who is intent on using a form for smaller contracts, it would be better to base it on this latest form published by FIDIC.

¹⁰ David M Walker, *“The Oxford Companion to Law”*, Clarendon Press, Oxford, 1980.

¹¹ Nael G Bunni, *“FIDIC’s New Suite of Contracts” – Clauses 17 to 19, ‘Risk, Responsibility, Liability, Indemnity, Insurance and Force Majeure’*, [2001] 18 ICLR, page 525, last paragraph.

The New Major Books

As stated earlier, the new three major books (the new Red Book, the new Yellow Book, and the Silver Book), are very similar in format. However, before considering that similarity in format, it might be helpful to have a general overview of where the new suite of contracts fits with respect to FIDIC's Conditions of Contract that existed prior to September 1999. Figure 5.1 provides that overview, but as mentioned before, one must remember that whilst the old forms of contract were distinguished from each other by the type of project for which they were used, the new forms are distinguished on the basis of the allocation of the design function. The old Red Book was for civil engineering projects whilst the New Red Book is for Construction where the design is carried out by the Employer or on his behalf ('Construction' includes building and engineering work). The old Yellow Book was for electrical and mechanical works whilst the New Yellow Book is for plant and design-build where the design is carried out by the contractor (for electrical and mechanical plant, and for building and engineering works).

It is appropriate now to return to the similarity of the format of the new Forms of Contract. They each contain twenty clauses, seventeen of which have common titles and all of which have similar wording where the concepts match.¹² Although the number of clauses in each of these three forms of contract has been drastically reduced from 72 in the old Red Book, and 51 in the old Yellow Book, the number of words in each of the new forms has largely increased. Figure 5.2 shows the exact number of words in Part I of the various Forms of Contract. However, the wording is simpler and clearer than in the old books. The sentences are shorter and express less number of ideas making them easier to understand. Figure 5.3 shows the number of Sub-clauses in each of the New Red, New Yellow and the Silver Books.

Nevertheless, although the format is the same in all these Books, the Silver Book

Form of contract	Equivalent in the New Forms
Red Book, 4th Edn., 1992	New Red, where the DAB is either adhoc or the engineer acts as the DAB
Red Book, 4th Edn., with suppl. 1996	New Red, where the DAB is standing and the Board is independent and impartial
Yellow Book, 3rd Edn., 1988	New Yellow, 1999
Orange Book, 1st Edn., 1995	New Yellow, 1999
Newly developed forms	Silver Book and Green Book, 1999

Figure 5.1: Comparison of FIDIC's old and new Forms of Contract

¹² The three clauses that carry different titles are: Clause 3 ('The Engineer' in the New Red & Yellow Books and 'The Employer's Administration' in the Silver Book); Clause 5 ('Nominated Subcontractors' in the New Red and 'Design' in the New Yellow and Silver Book books); and Clause 12 ('Measurement and Evaluation' in the New Red and 'Tests after Completion' in the New Yellow and Silver Book books).

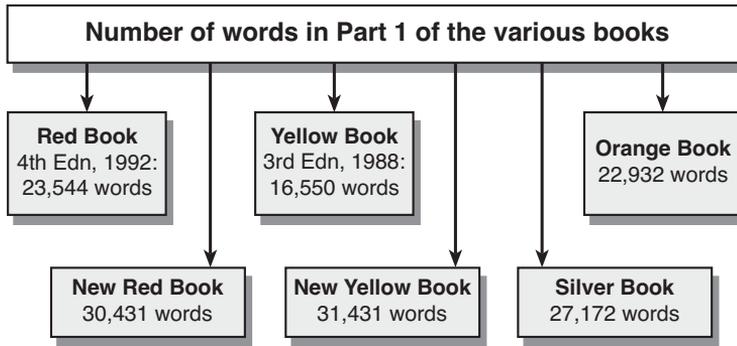
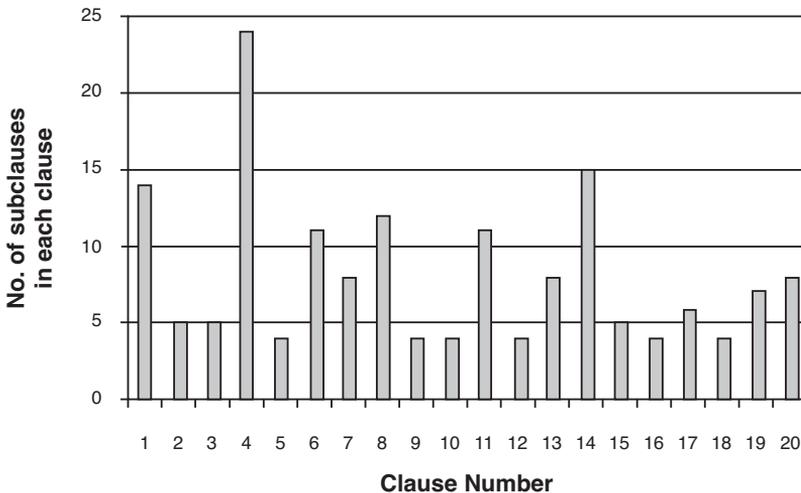


Figure 5.2: Comparison of the number of words in the text

can be distinguished by the absence of the function of the ‘Engineer’ and by its peculiar allocation of the risks and by their shift from the employer to the contractor. The other two books, however, continue the tradition of having an ‘Engineer’ and remain as a whole within FIDIC’s tradition of drafting standard forms of contract with a balanced allocation and sharing of risks between the employer and the contractor.

These distinguishing characteristics of the Silver Book should not be taken as a criticism of its concept and application. In particular, the Silver Book was conceived in response to the need created by those who favoured the use of private finance for infrastructure projects, and grew as a result of the demands associated with



Exceptions:

- Clause 5, where there are 8 subclauses in the New Yellow & Silver Books
- Clause 10, where there are 3 subclauses in the New Yellow & Silver Books

Figure 5.3: Number of subclauses in the New Suite of Contracts

BOT or BOOT projects and with the new ideas of mixing together design, construction and operation. This entailed demanding a fixed, lump sum contract price with least, or no, risk of an increase if and when unexpected events took place. Of course, privately financed projects require being financially viable with an assured return on the funds advanced. Therefore, although demanding a fixed, lump sum contract price means that the employer would be paying a higher price for the construction of the project, he would not normally object to having to do so if he were assured of an acceptable return on his total investment.

With these distinguishing features of the Silver Book, it is appropriate to firstly consider together the two books, the New Red and New Yellow, before looking at the Silver Book.

The New Red and Yellow Books

As stated above, the new forms are not revisions of the 1987 editions of the Red and Yellow Books. They form a total departure in format and in concept from their predecessors. Having dealt with the changes in format, it is perhaps more interesting to consider the significant changes in concept, which are many and, most of them, welcome. They are 18 in number and are as follows.

The 1987 Red and Yellow Books are used for civil engineering and electrical/mechanical works respectively, whereas the use of the New Red and New Yellow Books differs in relation to the allocation of the design function. Furthermore, the old Red Book and the old Yellow Book were intended to be used together whenever necessary in any project that had in it both civil engineering and electrical/mechanical works, for example hydroelectric power stations. This combination is not appropriate any longer where the New Red and New Yellow Books are concerned, since they are intended to cover the whole works, subject only to the responsibility for the design.

A new provision has been added in both of the New Red and Yellow Books, which recognise the risk of the “*Employer’s Financial Arrangements*”. Clause 2.4 provides as follows:

Employer’s Financial Arrangements

“2.4 The Employer shall submit, within 28 days after receiving any request from the Contractor, reasonable evidence that financial arrangements have been made and are being maintained which will enable the Employer to pay the Contract Price (as estimated at that time) in accordance with Clause 14 [Contract Price and Payment]. If the Employer intends to make any material change to his financial arrangements, the Employer shall give notice to the Contractor with detailed particulars.”¹³

¹³ Editor’s note: Should the Employer default, the Contractor may suspend or terminate the Contract (Section 16)

Sub-clause 2.5 in the New Books differentiates between a claim made by the Employer and a claim made by the Contractor. It provides for a different method of dealing with Employer's claims in that a notice should be given *"as soon as practicable after the Employer became aware of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given before the expiry of such period"*. The Engineer should then proceed in accordance with Sub-clause 3.5 to agree or determine (i) the amount (if any) which the Employer is entitled to be paid by the Contractor, and/or (ii) the extension (if any) of the Defects Notification Period in accordance with Sub-clause 11.3. This is quite different from the strict requirements imposed on a contractor submitting a claim (see below).

Both old and new books feature an Engineer in place, but differ in the allocation of duties, in particular with respect to the design function. Clause 3 of the New Red and New Yellow Books deals with the Engineer. Sub-clauses 3.1 *"The Engineer's Duties and Authority"*; 3.2 *"Delegation by the Engineer"*; and 3.4 *"Replacement of the Engineer"* in the New Red Book are very similar to those in the old Red Book, but Sub-clause 3.3 *"Instructions of the Engineer"* is quite different as it deals with and relates to the design function.

There is a fundamental change from the old to the new books in the Role of the Engineer. Sub-clause 2.6 in the old Red Book and Sub-clause 2.4 in the old Yellow Book require the Engineer to be impartial, as can be seen from the following text:

"Wherever, under the Contract, the Engineer is required to exercise his discretion by: ... , he shall exercise such discretion impartially within the terms of the Contract and having regard to all the circumstances...",

whereas Sub-clauses 3.5 in the New Red Book provides as follows:

"3.5 Whenever these Conditions provide that the Engineer shall proceed in accordance with this Sub-clause 3.5 to agree or determine any matter, the Engineer shall consult with each Party in an endeavour to reach agreement. If agreement is not achieved, the Engineer shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances..."

The higher standard of performance of Fitness for Purpose applies whenever the Contractor is required to design under the new books. Thus, it is specified in the first paragraph of Sub-clause 4.1 of the New Yellow Book that *"When completed, the Works shall be fit for the purposes for which the Works are intended as defined in the Contract."* (see also Sub-clause 4.1(c) of the New Red Book and Clause 11.3 in both books relating to Defects Notification Period).

Whilst all the books recognise the Matrix of pure Economic Risks, the wording of the provisions of Sub-clause 4.2 relating to performance security differs greatly

from its equivalent under the old books. So, for example:

- On-Demand Guarantee or Surety Bond is permitted under the new books;
- The Employer is not permitted to make a claim under the Performance Security except for amounts to which he is entitled in specified events;
- An indemnity is specified where the Employer claims to the extent to which he is not entitled; and
- The Employer is required to return the Performance Security within 21 days after receiving a copy of the Performance Certificate, see Sub-clause 11.9.

Sub-clause 4.21 in the new books introduces the new requirement of the Contractor having to produce “Progress Reports” such that “*Unless otherwise stated in the Particular Conditions, monthly progress reports shall be prepared by the Contractor and submitted to the Engineer in six copies.*” The Sub-clause continues by prescribing that these Reports should be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates and gives in detail what they should contain.

In the New Yellow Book where the design function is given to the Contractor, there are many new provisions, the most important of which is the “*Employer’s Requirements*”. Sub-clause 5.1 provides as follows:

“General Design Obligations

5.1 The Contractor shall carry out, and be responsible for, the design of the Works. Design shall be prepared by qualified designers who are engineers or other professionals who comply with the criteria (if any) stated in the Employer’s Requirements. Unless otherwise stated in the Contract, the Contractor shall submit to the Engineer for consent the name and particulars of each proposed designer and design Subcontractor...”

The term Employer’s Requirements is defined in Sub-clause 1.1.1.5 and its significant importance is perhaps reflected in the number of Sub-Clauses in which it is referred to: 25 Sub-Clauses throughout the New Yellow Book. The drafting of these requirements is probably the main source of success or failure of the project and of the disputes that might arise in a project under this form of contract. The Employer’s Requirements have a number of contrasting requirements:

The Employer’s Requirements should be:

- Complete, including all parameters relating to the required quality; the tests which must be successfully carried out during and after construction; the expected performance; how to operate and to maintain the project; the manuals to be supplied; and details of the spare parts and their cost,

- YET by specifying all these parameters, the Contractor’s liability must not be compromised, including the obligation of fitness for purpose;
- The Requirements must be drafted in a precise manner to define what the Employer requires,
 - YET, they should be flexible enough to generate one of the main advantages of a design-build contract, namely the Contractor’s expert input into the design and construction of the project;
- The Requirements should be demanding enough to enable the Employer to successfully choose the most suitable Contractor from amongst the tenderers invited to bid,
 - YET, the tenderers should not be required, at the tender stage, to provide more than the necessary information for the correct decision on the successful tenderer;
- The Requirements must be sufficiently detailed to establish the purposes of the project,
 - YET, concise enough not to limit the Contractor’s ability to properly design the works or to restrict his ingenuity in searching for the most appropriate solution.

The provisions of the famous Clause 12 of the old Red Book (*Sufficiency of Tender and Not Foreseeable Physical Obstructions or Conditions*) have been maintained in the New Red and Yellow Books, the penultimate paragraph of Sub-clause 4.12, but these provisions have been altered such that:

“... before additional Cost is finally agreed or determined under subparagraph (ii), the Engineer may also review whether other physical conditions in similar parts of the Works (if any) were more favourable than could reasonably have been foreseen when the Contractor submitted the Tender. If and to the extent that these more favourable conditions were encountered, the Engineer may proceed in accordance with Sub-clause 3.5 [Determinations] to agree or determine the reductions in Cost which were due to these conditions, which may be included (as deductions) in the Contract Price and Payment Certificates. However, the net effect of all adjustments under sub-paragraph (b) and all these reductions, for all the physical conditions encountered in similar parts of the Works, shall not result in a net reduction in the Contract Price.”

The provision regarding time limits for ‘Payment’ is altered in Sub-clause 14.7 of the new books such that the Employer will be required to pay to the Contractor “... (b) the amount certified in each Interim Payment Certificate within 56 days after the Engineer receives the Statement and supporting documents; and (c) the

amount certified in the Final Payment Certificate within 56 days after the Employer receives this Payment Certificate.”

There are significant changes in risk allocation in the new books, as can be seen for example in Clauses 15.5 and 19. Sub-clause 15.5 introduces the concept that the Employer is entitled to terminate the Contract, at any time for his convenience, by giving notice of such termination to the Contractor. Clause 19 substitutes the concept of “*frustration*” in the old Red Book with that of “*Force Majeure*”, which is defined in that clause as

“an exceptional event or circumstance:

- (a) which is beyond a Party’s control,*
- (b) which such Party could not reasonably have provided against before entering into the Contract,*
- (c) which, having arisen, such Party could not reasonably have avoided or overcome, and*
- (d) which is not substantially attributable to the other Party.”*

It may include, but is not limited to, exceptional events or circumstances of a number of events listed therein, so long as conditions (a) to (d) above are satisfied.

A new concept of “*Limitation of Liability*” is now introduced in the three New Books. Sub-clause 17.6 provides that the parties are not liable to each other:

“for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than under Sub-clause 16.4 [Payment on Termination] and Sub-clause 17.1 [Indemnities] ...”

The total liability of the Contractor to the Employer, under or in connection with the Contract other than in limited circumstances is required to be stated in the Particular Conditions or (if a sum is not so stated) the Accepted Contract Amount. However, this Sub-clause is not intended to limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.

Clause 18 ‘Insurance’ in the new books is significantly different from its equivalent in the old Red Book. An analysis of this topic was made by the writer and published recently in the International Construction Law Review.¹⁴

Sub-clause 20.1 provides for the procedure to be followed where a contractor makes a claim. Strict time limits apply in that situation: A notice within 28 days after the Contractor became aware, or should have become aware, of the event

¹⁴ See Reference 11 quoted above.

giving rise to the claim. Subsequently, details must be submitted within 42 days after the Contractor became aware, or should have become aware, of the event giving rise to the claim. Due to the importance of the changes made in this connection, the text of the relevant part of Sub-clause 20.1 is quoted below.

“Contractor’s Claims

20.1 If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Engineer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-clause shall apply.

The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Engineer...

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Engineer a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed...”

Sub-clause 20.1 also provides for strict time limit on the Engineer to respond to a Contractor’s claim. It provides *inter alia* the following:

“Contractor’s Claims

20.1 If the Contractor considers himself to be entitled to any extension of the Time for Completion...

The Contractor shall keep such contemporary records...Without

admitting the Employer's liability, the Engineer may, after receiving any notice under this Sub-clause, monitor the record-keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer to inspect all these records, and shall (if instructed) submit copies to the Engineer.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Engineer and approved by the Contractor, the Engineer shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within such time.

Each Payment Certificate shall include such amounts for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.”

The above-mentioned provisions are extremely important in reducing a number of usual conflicts that have persisted within, and beleaguered, the construction industry.

Sub-clauses 20.2 to 20.4 in the new books introduce a new step, the Dispute Adjudication Board (DAB), in the dispute resolution mechanism prior to the Amicable Settlement procedure. This new step is, with minor variation, similar to that under the 1996 Supplement to the old Red Book. The adjudication role of the Engineer is thus taken away from him and handed instead to the DAB, which can be either a single person or a number of persons chosen with specific qualifications, which are described in the Form of Contract. The new books include details of the Agreement that must be entered into between the Parties and the members of the DAB.

However, the appointment of a DAB under Sub-clause 20.2 differs from that under the 1996 Supplement in a few important aspects:

- The DAB in the New Red Book should be appointed by the date stated in the Appendix to Tender, which suggests 28 days after the Commencement Date.
- The Guidance to the New Red Book includes the possibility of reverting to the traditional role of the Engineer.
- The DAB in the New Yellow Book is only appointed by a date 28 days after a Party gives notice of its intention to refer a dispute to a DAB.

The New Silver Book

As discussed above, the new Silver Book is a newcomer to the field. To understand the philosophy and reasons behind its conception, it is best to quote from the authoritative paper written by the Chairman of FIDIC's Contracts Committee and Leader of the Task Group who prepared the FIDIC 1999 Conditions of Contract.¹⁵

“Not only is it a fact of life that many employers have always demanded ‘fixed, lump sum contract prices’, and that FIDIC did not have a suitable standard form to cater for such demand, but in recent years the trend has been towards private financing (not only of private investment and speculative projects, but also of public infrastructure projects). The prerequisites for obtaining private finance for a project are vastly different from those of obtaining government or other public money. Private financing requires that the project is independently viable in financial terms, and that there will be, so far as possible, an assured return on the finance provided. The lenders on a BOT or similar project will do their calculations showing the outlay over the construction period and the income over the succeeding operation period. For the return to be reasonably assured, the bases for their calculations will have to be as firm as possible. If the construction work costs more than reckoned (inclusive of any contingency allowance), then the calculations will not hold. If the construction time is longer than planned, then the income will not begin to come in on time, and the calculations will not hold. Therefore, such lenders have to ensure that the risks of cost and time overruns of the construction contract are limited as far as humanly possible. Such lenders are aware that contractors will have to charge a premium for carrying the additional risks necessary to provide the required greater security of construction cost and time. The premium in certain cases may reasonably be large. However, they would rather accept such premium and include it in their calculations before embarking on the project, than discover later on that the project is no longer viable and that they are incurring an overall loss.”

Thus, the Silver Book has been and is intended to be used for special projects and is not a ‘contract for all seasons’, as the old Red Book was used in practice, but I hasten to add that it was not intended to be used in that way. The Silver Book, if and when used, ought to be entered into with the utmost care, with all eyes open focusing on the risks that have been shifted, from a balanced contract between the parties to one where the risks are mostly allocated to the Contractor. These risks are spread over a number of the Sub-Clauses of the Form, including the following:

- Sub-clause 3.5: As stated above, there is no Engineer in place to deal with the usual administrative matters and instead it is the Employer who carries out

¹⁵ Christopher Wade, “The Silver Book: The Reality”, ICLR, Vol. 18, Part 3 [July 2001], page 500.

such a role. Therefore, it is the Employer who makes the determination when no agreement is reached between him and the Contractor. Sub-clause 3.5 states in part the following: *“If agreement is not achieved, the Employer shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.”* The word ‘fair’ should be noted.

- Sub-clause 4.12: This Sub-clause provides a significant shift of a number of risks to the Contractor, as clear from its text, which provides as follows:

“4.12 Unforeseeable Difficulties

Except as otherwise stated in the Contract:

- (a) the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Works;*
- (b) by signing the Contract, the Contractor accepts total responsibility for having foreseen all difficulties and costs of successfully completing the Works; and*
- (c) the Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs.”*

- Sub-clause 5.1: Errors, inaccuracies or omission of any kind in the original Employer’s Requirements as included in the Contract are deemed to be a Contractor’s risk, as can be seen from the text of this Sub-clause, which states, in part, the following:¹⁶

“The Employer shall not be responsible for any error, inaccuracy or omission of any kind in the Employer’s Requirements as originally included in the Contract and shall not be deemed to have given any representation of accuracy or completeness of any data or information, except as stated below. Any data or information received by the Contractor, from the Employer or otherwise, shall not relieve the Contractor from his responsibility for the design and execution of the Works.”

Therefore, the Contractor has to take on board not only strict liability for design and the Fitness for Purpose standard of performance, but also be liable for *“any error, inaccuracy or omission of any kind”* in the Employer’s original Requirements.

- Sub-clause 5.8: In a similar treatment, the responsibility for design errors, etc., is shifted to the Contractor, as the text of this Sub-clause provides the following:

“5.8 Design Error

If errors, omissions, ambiguities, inconsistencies, inadequacies

¹⁶ See the second paragraph of Sub-Clause 5.1.

or other defects are found in the Contractor's Documents, they and the Works shall be corrected at the Contractor's cost, notwithstanding any consent or approval under this Clause."

- The consequence of any of the following risks, derived from the terms of the New Red and Yellow Books, is borne by the Contractor, since these risks have been omitted from the list of Employer's Risks in the Silver Book:

"(f) use or occupation by the Employer of any part of the Permanent Works, except as may be specified in the Contract;

(g) design of any part of the Works by the Employer's Personnel or by others for whom the Employer is responsible, if any; and

(h) any operation of the forces of nature which is Unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventative precautions."¹⁷

Whilst it is expected that the Design risk should be shifted to the Contractor, the shift of the other two risks quoted above is significant and should bring to the mind of the Parties that *high risk* means a corresponding high contingent price to cover it.

- Sub-clause 20.1: With no Engineer in place to deal with the Contractor's claims, it is the Employer who receives the claims when submitted under Sub-clause 20.1 and it is he who responds with either approval or disapproval with detailed comments.

Changes for the Employer and others for the Contractor

In the tradition of FIDIC, the new concepts have been incorporated into the new books wherever they were appropriate, with some being in favour of the Employer and others in favour of the Contractor, as appropriate from the point of view of risk allocation. The following list shows the significant changes grouped on the basis of the benefit and risk sharing envisaged.

New provisions in the 1999 Suite of contracts considered to be in favour of the Employer:

- Sub-clause 3.4: The Employer is now entitled to replace the Engineer on a Notice of 42 days, provided that the Contractor does not raise a reasonable objection by Notice to the Employer.
- Sub-clause 4.1 (c): The higher standard of liability of Fitness for Purpose now applies whenever the Contractor designs (see Clause 4.1 of the New Yellow,

¹⁷ A comparison between Sub-Clause 17.3 "Employer's Risks", in the Silver Book and that in the other two Books, would reveal that these risks have been shifted to the Contractor.

4.1(c) of the New Red and Clause 11.3 in both re Defects Notification Period.)

- Sub-clause 4.12: Changes in Clause 12 of the 1987 Red Book, (Clause 4.12 in the new books, see effect of more favourable conditions in penultimate paragraph).¹⁸
- Sub-Clauses 4.21 and 14.3: The Contractor is now required to submit extremely detailed monthly progress reports to the Engineer, including charts, photographs, etc. to accompany applications for interim payments.
- Sub-clause 11.3: The Employer is now entitled to extend the Defects Notification Period for the Works or a Section thereof, for up to 2 years in certain circumstances.
- Sub-Clauses 15.5 and 19.6: The Employer is now entitled to terminate the Contract, after giving Notice, at any time for his convenience, provided such termination is not for the purpose that the remaining work be executed by the Employer himself or by another contractor.
- Sub-Clauses 17.3: The shift in risk from the Employer to the Contractor, particularly in the Silver Book.
- Sub-Clauses 20.1: The Contractor is now required to give 'Notice to the Engineer for any claim to any extension of the Time for Completion and/or any additional payment describing the event or circumstance giving rise to the claim'. This notice 'should be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.'
- Sub-clause 20.1 contains a severe sanction should the Contractor fail to give notice of a claim within the period of 28 days. Such failure would mean that the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim.

New provisions in the 1999 Suite of contracts considered to be in favour of the Contractor:

- Sub-clause 2.4: As stated above, the Employer is required to submit on 28 days of the Contractor's request "*reasonable evidence that financial arrangements have been and are being maintained*" to pay the contract price. This is a powerful mechanism that ensures the ability to pay before incurring the costs and eliminates any delay or false reasoning for non-payment of due monies to the Contractor.
- Sub-clause 2.4: This clause also requires the Employer to give a Notice with detailed particulars, if any material change is intended in the financial

¹⁸ Editor's note: In essence, the paragraph provides for a reduction of the contract price if conditions are better than those anticipated at the time of tendering.

arrangements.

- Sub-clause 2.5: This Sub-clause requires the Employer (or Engineer) to give notice and particulars to the Contractor if he considers himself entitled to payment or extension to the Defects Notification Period, specifying the basis and including substantiation of claim. The notice must be as soon as practicable after the Employer “became” aware of this event giving rise to the claim.
- Furthermore, the Employer has the right of set off against, or of deduction from, a certified amount in a Payment Certificate or otherwise to claim from the Contractor under this Sub-clause.
- Sub-clause 13.7: The Contractor’s right to adjustment of the Contract Price resulting from changes in the law is extended to include changes to the judicial or official Governmental interpretation of such laws made after the Base Date.
- Sub-clause 14.8: This Sub-clause entitles the Contractor to receive financing charges, compounded monthly on unpaid amounts during periods of delay, calculated as 3% above the discount rate of the central bank. This entitlement is without formal notice or certification and without prejudice to any other right or remedy.
- Sub-clause 16.1: The Contractor is entitled under the new books, after giving 21 days’ notice, to suspend or reduce the rate of work where the Engineer fails to certify an interim payment certificate or the Employer fails to provide information regarding his financial arrangements. Most significant perhaps is that this clause is incorporated not only in the New Red and Yellow Books, but also in the Silver Book.
- Sub-clause 17.6: Sub-clause 17.6 in the new books “*Limitation of Liability*” permits the Contractor to limit his liability.
- Clause 19: This Clause in the new books “*Force Majeure*”, replaces the Special Risks concept.
- Sub-clause 20.1: As stated above, one of the major new conceptual changes is the new time limit of 42 days imposed on the Engineer to respond to a claim from the Contractor, or to respond to further particulars supporting a previous claim, with approval or disapproval giving detailed comments.
- Sub-clause 20.3: The long-standing and much criticised quasi-arbitral role of the Engineer in the settlement of disputes is now removed and given to a DAB, either standing or ad hoc.

Conclusions

There are sufficiently valuable innovations and new concepts in the New Red and Yellow Books, some of which have been overdue for some time, to entice the

construction industry to adopt them for use as standard forms. No other form has managed to treat the major issues dealt with by these forms so successfully. However, as usual in such ventures, there are certainly some remaining problems in a number of provisions that are yet to be tackled and resolved by amendments. In particular, amongst the amendments that are required are those to Clauses 17 and 18, the 'Risk' and 'Insurance' clauses.¹⁹

Where the Silver Book is concerned, it is perhaps appropriate to quote once again from Mr. Christopher Wade (see footnote 14), who referred to the Silver Book as a form of contract that sets out clearly and exactly which party is to bear which risk. Thus, contractors and employers

"...can enter into such contracts with their eyes wide open. They can be clearly aware of what risks are their responsibility, instead of fumbling about in the darkness and hoping for the best, as circumstances have often required them to do in the past."²⁰

As to the Green Book, there is unfortunately some confusion in the meaning and treatment of the important terms of 'liability', 'risk', 'responsibility' and 'insurance', which require special attention. The confusion seems to have been resolved in the Test Edition of the new Dredging and Reclamation form of contract, another short form of contract, which has been issued recently by FIDIC for comments.²¹ For those seeking such a contract, this latter form seems to be more appropriate to adopt.

I would predict and therefore would not be surprised if some jurisdictions were to adopt these forms for their own domestic forms of contract, after appropriate amendments.

¹⁹ Such of these problems have been isolated and resolved by amendments incorporated in the newly proposed conditions of contract in Ireland, which are based on the New Red Book.

²⁰ As in reference no. 14 quoted above, but page 501.

²¹ Form of Contract for Dredging and Reclamation Works, published by FIDIC as a Test Edition in 2001.

6

A New Approach — the New Engineering Contract

Martin Barnes

Abstract

Some fifteen years ago there was a strong belief amongst a small number of people working in engineering and construction project management in the UK that the then current standard forms of contract were seriously deficient in two main respects: firstly, they reinforced the adversarial behaviour of the main players and, secondly, they obstructed the application of good project management practice at the interfaces between the main players.

A team was set up, headed by Martin Barnes, to design a radically new contract that would eschew these shortcomings and provide other advantages. The new contract was to have three principal characteristics: a simple structure, simple, non-legalistic language, and versatility. Versatility would be achieved if the same contract could be used for any type of engineering or construction work, for any chosen contract strategy, at any interface including subcontracts and in any part of the world. A secondary objective was that the new contract should be designed with electronic use in mind.

The work of specifying, designing and drafting the new contract was sponsored by the Institution of Civil Engineers. It was carried out by a small team of people drawn from different backgrounds and with expert legal contribution. The result was the New Engineering Contract (NEC). After full consultation and trials, it was first published for general use in 1993. Since then it has been taken up widely by the industry and its clients, and achieved considerable success. It is known to have been used in at least twenty countries and on a wide variety of projects. The growth in its use has been exponential, as more organisations gain experience of it. Typically, they try it out or come across it on one project and then decide to use it generally.

The family of NEC contracts has grown so that it now includes contracts for the professional contributors to projects (designers, project managers, etc.), a version for very simple, small projects and a supplement that provides for full partnering/alliancing around a project team. Most of the major clients for infrastructure projects in the UK now use the NEC as their standard form. This covers the very largest projects, such as the building of the new railway from the Channel Tunnel into London, through to the myriad of small projects undertaken, for example, by local government authorities. All central government highway projects are now managed using the NEC. A detailed commentary on a practical application of the NEC is provided by Tim Wood, through the Tamar Bridge Case Study in Chapter 8.

The following pages describe the main features of the NEC, concentrating on those that are different from traditional forms such as FIDIC.

The NEC is essentially a system for managing the interfaces and, as such, is much more than a traditional contract. It allocates the risks very clearly and, in some respects, very

differently. All of the unhelpful traditional processes have been modified or eliminated. The management procedures built into the NEC are also published as flow charts.

The approach to disputes built into the NEC is: firstly, that few should grow to the point where they can be considered a dispute; and, secondly, that most of that few should be settled by the participants in the project and, thirdly, that the very, very few which cannot be so settled should be settled quickly by a non-legal third party expert.

This last resort process is called adjudication, but it should not be confused with other processes used outside the NEC which are now also called adjudication. A note at the end of this chapter delves into the important function of the Adjudicator, or 'neutral party'. The note has been prepared drawing from Martin Barnes' extensive project experience, and compares adjudication with arbitration, in clear and frank words — his own, heartfelt views.

The New Engineering Contract

The New Engineering Contract (NEC) was developed by a team headed by the author under the auspices of the Institution of Civil Engineers in the UK. It was published for general use in 1993. Since then it has become very widely used in the UK and also in more than twenty countries around the world. It breaks away entirely from traditional construction and engineering contracts. The philosophy of the NEC is summarised in its three basic objectives. They are — clarity, simplicity and stimulus to good management. The last is by far the most important change from previous practice.

Clarity and simplicity mean that the NEC uses a simple structure, simple language, simple procedures and clear risk allocation.

Flexibility means that the NEC can be used for any type of construction work, any contract strategy, and work on any scale in any place. The NEC can also be used for all the contracts needed on one project. These may include contracts for main contractors, subcontractors and professionals.

Stimulus to good management means clear roles, joint decision-making, proper motivation, a forward-thinking culture and controlled outcomes in terms of cost, time and function of the completed project.

Joint decision making is achieved by early warning of problems and by using a new method for compensating contractors for events, which are at the Employer's risk.

Proper motivation means collaborative working at all levels and sources of dispute dealt with on site. Achieving the Employer's objectives dominates the management style.

In the use of the New Engineering Contract, the traditional adversarial approach is eliminated. This is because a contractor's profit depends only on his own efficiency in doing the work. He has no need to make retrospective claims for additional money and, indeed, the contract gives him no right to such claims.

Forward thinking is stimulated by joint uses of the programme, by early warning of all problems and by concentration upon achieving the final objectives for the project.

The NEC is the only standard contract which is based on modern best practice in Project Management. It stimulates forward-looking control of cost, time and performance. Uniquely, and for the first time, it provides for effective management and control of risk.

Much of the NEC is 'general purpose' and can be used in all situations. For example, the contract assumes that there are several contractors working alongside on the same site. Consequently, it works well for CM¹ package contractors and for multiple subcontractors. Every contract allows for the Contractor doing some

¹ Construction Management

design. Consequently, there is no need for a special 'design and build' version of the contract.

The flexibility of the NEC is achieved through choosing the right contract from the NEC family of contracts and choosing the right options for clauses within the contract.

The NEC family is made up of seven standard contracts. They all use the same basic set of procedures, the same management culture and the same terminology.

The four main members of the family are:

- the engineering and construction contract;
- the subcontract;
- the professional services contract; and
- the Adjudicator's contract.

Three other members of the family are:

- the short contract;
- the short subcontract; and
- the NEC partnering option.

The main construction contract is called the Engineering and Construction Contract (ECC). The roles defined in this contract are the Employer, the Project Manager, the Contractor, the Subcontractors and the Supervisor. There is also the Adjudicator whose role it is to settle disputes that might arise between the Project Manager acting for the Employer and the Contractor. There can be any number of professionals helping any of these main parties. Designers, for example, can be working for the Employer or for the Contractor or both.

The options in the main contract set the contract strategy by determining the pricing arrangement for the particular contract. The options are:

- Lump sum tendered prices;
- Tendered prices with Bill of Quantities;
- Target cost with Profit Share;
- Management Contract; and
- Cost-reimbursable contract.

These main options each comprise of a small number of clauses added to the core clauses of the NEC contract. There are also several single-clause, secondary

options for matters like parent company guarantee, retention, formulae for inflation adjustment, delayed damages and multiple currencies.

The compensation event procedure is an important element of the NEC. It is used to deal with everything which is at the Employer's risk — including variations. The compensation is based on the Contractor's forecast of the effect of the event on his cost and on his programme. Notice that the compensation is not based on the Contractor's original prices. Consequently, he is indifferent to the Project Managers choice of solutions to the problem. A fee percentage is added to the forecast cost. The Project Manager accepts or rejects the Contractor's quotation for each event. There is no later review of the amount of compensation which has been decided. The Contractor takes the risk that those matters that are within his control may vary from what he expected.

In summary, the NEC contracts were designed to be very different from traditional contracts – and they are. They were designed from a clean sheet of paper, as a means of managing the interfaces in a complex project. The NEC contract is supported by full guidance notes for the new user, which are available on the CD, along with flow charts of all the management procedures and full electronic versions of the contract.

It has been stated that the New Engineering Contract is being used for over ninety percent of infrastructure projects in the UK. It is being used for very large civil engineering projects such as the building of the Channel Tunnel Rail Link from London to the English Channel ports. It has been used for major power generation projects. It is used for all major road schemes funded by the UK central government. London Underground now uses it for their major projects and it is being used for a large number of building projects around the world. It has also been used for a small number of projects in the Pacific Rim region including New Zealand, Australia, Hong Kong and China.

It is very clear that site relationships are very much better when NEC is used than when traditional contracts are used. Real partnerships develop and the certainty of outcome in terms of cost, time and performance of the completed projects and profit for the contractors and subcontractors is significantly improved. Contracts are settled very much more quickly and with hardly any argument. Most Adjudicators have nothing to do. Perhaps the most convincing argument for the value of the NEC and the improvement that it is over traditional contracts such as ICE and FIDIC, is that, as far as is known, every organisation which has tried the NEC² once has continued to use it. The proof of the pudding has come from eating it!

² For further information about the NEC please contact the publishers Thomas Telford Services Ltd, 1 Heron Quay, London, E14 4JD, UK, telephone number +44 207 665 2484, www.newengineeringcontract.com. Thomas Telford publishes the NEC in hard copy and in electronic version: the NECD (a CD interactive version that allows contract drafters to prepare documents including the particulars of the parties and all other matters pertaining to the Contract).

Avoiding Disputes using the Neutral Party — Adjudication

Having been involved in many arbitrations as an expert witness, I hold the view, which I have had for some time and which many others share, that arbitration is a seriously defective method of settling disputes on engineering and construction projects. It is ludicrously slow and ludicrously expensive and its outcome is very often random. It is not unusual for disputes to take years to settle and for the cost of the process to be several million pounds or dollars. The process of arbitration is conducted by two teams, each of which is determined to vanquish the other. Seldom were the people in either team involved in the project on which the dispute arose. Instead, they are professionals in conducting the process of arbitration, whose pay is proportional to how complicated the process becomes and how long it takes to complete.

My experience, which may not be typical, is that the outcome of an arbitration is, more often than not, a decision which is unconnected with the realities of what really happened. By the time the arbitrator makes his decision (or their decision if there are three of them, which is usual in international arbitrations) the issues at stake have been banged and buffeted about for so long that their resemblance to what really happened on the project has disappeared.

I do not argue that arbitration is worse than litigation; I have no experience of litigation. I do argue that arbitration is a ridiculous method of solving disputes on projects. It must be within the power of intelligent people to invent a process which takes a fraction of the time, costs a fraction of the money and more often produces the right answer.

My own view of what would be better is expressed in the adjudication procedure in the New Engineering Contract. The NEC design team, which I was fortunate to lead, designed this procedure around an independent dispute settling person whom we called the adjudicator. He is a technical, non-legal person (or a group of people or a firm) appointed jointly by the parties when they enter the contract. He, she or they do nothing until they are first called upon to make a decision about a dispute — hopefully never. Unlike dispute review boards and similar bodies, they are not expected to keep in touch with the conduct of the work and are paid no retainer. Their fees for dealing with the dispute are shared equally between the parties whatever the outcome of the matter. These last two features of the system are designed to discourage parties from referring matters to the adjudicator.

The adjudicator is not constrained to conduct the investigation of the matter in dispute in any particular way but is constrained to decide quickly. His, her or their decision is based on what the parties submit at the beginning of the process.

The parties do not have experts or legal representation but the adjudicator can get help when he/she or they decide that they need it.

The adjudication used in the NEC should not be confused with other types of

dispute resolution. It is an integral part of the NEC process, although it is not intended that adjudicators should often have anything to do. The main thrust of the NEC is that disputes are settled by the parties themselves without recourse to an independent third party. The detailed processes for management which are built into the NEC include accumulation of records that, in the event of a dispute, form the basis of the information which the adjudicator uses. No other standard form of contract has this facility. It makes for a very rapid reference of disputes to adjudicators when necessary and it is very cheap and efficient because production of additional documents is minimised.

The contract includes very tight time periods for submission of disputes to the adjudicator and for the adjudicator to reach a decision. The parties can, of course, extend these periods by mutual agreement and have done so in one or two cases. If either party is unhappy with the result of the adjudication, he or she can take the matter to arbitration or to litigation. Obviously, if this were to happen very often, the adjudication process would not be working very well.

The NEC dispute resolution procedures are working very well in the sense that very few disputes are going to the adjudicator and those that do are being settled quickly and efficiently. The NEC is essentially a contract to manage construction and engineering work. Consequently, if there is a dispute, it is likely to be about the management of the work. There should be very few disputes indeed about legal interpretation of the contract. A consequence of this characteristic is that the adjudicators appointed under the NEC should be essentially project managers. They will discharge the function best. It would be quite inappropriate to have a lawyer as an adjudicator under a NEC contract.

Where a project is being run collaboratively, as when the NEC is being used, the idea of mediation loses some of its point. Mediation, dispute review boards and other forms of alternative dispute resolution generally are approaching dispute resolution from an uncomfortable stand point when a partnering type of contract is used. Adjudication, and particularly adjudication as set out in the NEC, seems to be rather better.

7

The New Zealand Standard Conditions of Contract

Suzanne Wilkinson

Abstract

This chapter presents a comparison of New Zealand Standard Conditions of Contract, vis-a-vis the conditions of contract issued by the International Federation of Consulting Engineers (FIDIC's new Red Book) and the New Engineering Contract (Engineering and Construction option) of the Institution of Civil Engineers, London, with particular reference to risk apportionment and management, and the processes for dispute resolution. The last two forms are referred to in this chapter respectively as the FIDIC and NEC forms of contract.

The construction industry in New Zealand currently uses a range of standard contracts. These contracts differ in length, content and use. They range from individually-drafted contracts for minor works, to contracts for international projects. This chapter refers particularly to the most common types of standard forms of contract used in New Zealand, NZS3910:1998 and the new special version, NZS3915:2000.

The goal pursued by the writer is to point out differences and similarities, as a contribution to the current discussions on the updating of NZS3910, without presuming to design revised or new clauses for the New Zealand standard form.

Introduction: The General Conditions of Contract and their Intentions

Kennedy–Grant¹ discusses the nature of general forms of construction contracts. He points out that construction contracts are “...neither easy to define nor easy to understand because they are of more than one type”.

He supports this assertion by explaining, first, that contracts are complicated because they can be either building or engineering contracts (dams, process plants, wastewater treatment plants, etc.). Second, contracts are used for differing types and quantities of work, involving from a few people in a simple contractual arrangement (employer, architect, builder) to large numbers of people and organizations in complex contractual arrangements. Third, he refers to the different procurement options available, from traditional construction procurement based on bidding documents including drawings and specifications, to design and build contracts, and other more elaborate arrangements.

Kennedy-Grant points out that the different procurement options necessitate different contract approaches, appropriate for construction only, design and construction, design, construction and operation, and so forth. The following discussion takes into account the inherent complexity thus defined.

NZS3910:1998 and other Standard Conditions of Contract in use in New Zealand

NZS3910:1998² (hereafter referred to as “NZS3910”) is an established and tested standard form of contract, used for most building and civil engineering construction in New Zealand, generally applied with the traditional form of procurement. The contract is designed for all construction and building contracts including complex construction projects where an independent specialist consultant is used to administer the project.

Currently NZS3910 is being updated (DZ3910:2002³) and revised. The draft changes suggest that the majority of the sections will be subjected to minor alteration aimed at reducing ambiguities and inconsistencies, and also reflecting changes in the law, or meeting the needs of current industry practices.

NZS3910 makes provision for the Contract to be administered by an “Engineer” acting on behalf of the Principal where the Engineer “...means the professional engineer, architect, surveyor or other one natural person identified in the Special Conditions or such other one natural person as may be subsequently appointed by the Principal...”. Under Section 6 of this contract the Engineer’s powers and responsibilities are set out and his/her dual role is defined, first, as expert adviser to, and representative of, the Principal, and second, as independent decision-

¹ T Kennedy-Grant, *Construction Law in New Zealand*, Butterworths, Wellington, 1999.

² NZS3910:1998. *Conditions of Contract for Building and Civil Engineering Construction*, Standards New Zealand, 1998.

³ DZ3910:2002 is a draft revision of the above, being circulated for comment at the time of writing.

maker and certifier.

A recent variation of the standard form is NZS3915:2000.⁴ This is a standard document for building and civil engineering construction where no person is appointed to act as Engineer in the Contract. The contract has been developed for use where the client administers the contract without the use of an engineer. The contract, in the foreword, specifically makes reference to “...a need expressed by the Registered Master Builders’ Federation of New Zealand for a New Zealand standard contract form for the situation where the client (Principal) administers the contract directly.” Hence the term “Engineer” has been removed throughout the document. Instead, Section 6 refers to a Principal’s Representative who can be the Principal or its representative. There is no reference to the independence of this person; instead, the duties, such as inspection, recording, measuring, and testing are defined, and the Representative’s role is set out, in relation to these functions.

Although still applicable in the traditional procurement approach, this contract form widens the options available. However, the document does point out that:

“NZS3910 is considered to be the appropriate form of conditions of contract for the general case – with NZS3915 used on comparatively straightforward projects where an experienced engineer, architect, surveyor or other suitable person (either a direct employee or another person) is not readily available to the Principal to act as Engineer to the contract.”

NZS3910 and NZS3915 are just two of the forms of construction contract available for use in construction projects in New Zealand. Other commonly used standard forms for construction are issued by different industry institutions. The most widely used ones are the Master Builders’ Federation (MBF) and The New Zealand Institute of Architects (NZIA) standard forms. The MBF form is intended for small building projects of any nature. However, the purpose of drafting NZS3915 was to meet the needs of the Master Builders’ Federation and so in future there may be a shift towards NZS3915, away from the MBF standard conditions.

The NZIA have designed a series of contracts for use by their members. The Standard Conditions of Contract, 2000 (SC-C1) is widely used by architects when they are engaged by a Principal for full services, including contract administration. The National Building Contract - General, 1998 (NBC-G1) is for use on contracts where the Architect does not undertake the contract administration of the construction project. In this case, the Architect may be involved in the design and prepare contract documentation. The National Building Contract - Small Works, 1999 (NBC-SW2) is for a similar purpose as NBC-G1, for smaller building projects, costing less than \$100,000.

⁴ NZS3915:2000. *Conditions of Contract for Building and Civil Engineering Construction* (where no person is appointed to act as Engineer to the contract), Standards New Zealand, 2000. Referred to as NZS3915 in the text. Where no specific reference is made in the text to NZS3915, the discussion on NZS3910 also refers to the former.

Many other organisations and professional bodies, companies and local authorities use either their own drafted forms of contract, or variations of NZS3910. The latter can differ widely from the original, after amendments, deletions, and additions. Detailed research must be made, to understand the impact of those changes on risk apportionment and project administration, before accepting the amended conditions.

General Comments

The following are general comments with regard to the readability, simplicity, interpretation and application of NZS3910, FIDIC⁵ and NEC⁶ contract forms.

In terms of readability and simplicity there are some pointed differences between the three main forms of contract under discussion. The largest difference is between the NEC and the other two forms. Whilst the NEC is written in clear, simple English, the uninitiated may find difficulty in navigating its clauses, because of the many options involved. In extreme cases, problems may arise if the wrong options are chosen, or one or more of the secondary optional clauses are omitted, resulting in opportunities for potential disputes. However, this should be overcome with careful attention to detail, which is in any case required when using any contract form for the first time.

Further, the NEC includes an important feature to assist the drafter and contract administrator: a series of flow chart diagrams for the main events that are likely to occur. The NEC extensively details these events, and provides separate flow charts which aim to “...help people using the NEC to see how the clauses of the NEC various options come together to produce clear and precise sequences of action for the people involved.” The FIDIC New Red Book also has some charts at the beginning of the document which outline the sequence and timing of actions to be followed for principal events, payments, and the handling of disputes. NZS3910 includes one flow chart within the guidelines. It is a useful general aid for the valuation of variations, but does not incorporate any other sequence flow charts.

The FIDIC construction contract and NZS3910 are fairly similar in format and are easier to follow for practitioners used to the traditional forms. In both the NEC and the FIDIC forms the text is broken into more manageable sub-clauses. In its present form, NZS3910 tends to have wordier sub-clauses and sub-sections which makes it slightly less readable. The three forms are organised in varying numbers of sections, not necessarily in the same sequence. This complicates the comparison of clauses between the documents with respect to the treatment of particular circumstances that may arise in contract administration.

One principal feature of the NEC is its use of refreshingly plain and easily understood

⁵ International Federation of Consulting Engineers (FIDIC), *Conditions of Contract for Construction —for building and engineering works designed by the Employer*, FIDIC, Lausanne, Switzerland, 1999.

⁶ The Institution of Civil Engineers, London. *The New Engineering Contract: The Engineering and Construction Contract*, 2nd Edition, Thomas Telford, London 1995.

language. However, changing of internationally well-understood terms can cause confusion among traditionally-minded users. For instance, the NEC avoids the use of the term 'Variation', and refers instead to changes requiring a 'Compensation Event' (as detailed in clause 60). Since 'variations' are universally understood and the term has been tested in legal practice, this seems an unnecessary departure from what in effect ends up as the same situation, i.e. a change in conditions or circumstances leading to extra payment and, possibly, an extension of time.

To assist with the interpretation and application of their various provisions, all three contract forms follow a similar approach, providing a set of guidelines. Both NEC and FIDIC have comprehensive guidelines, a feature which is not available in NZS3910 to the same extent.

A very good feature of the NEC, not found in the FIDIC document or in NZS3910, is the drafters' express aim to encourage a non-confrontational approach to contract management. Included in 'General', clause 10 is a statement that the parties *"...shall act as stated in this contract and in the spirit of mutual trust and co-operation."* The first section of the NEC also contains four clauses that highlight the importance of communication and set out communication procedures (clauses 13,14,16,17). These make it clear where the responsibility for communication lies and how communication is to be handled, thus aiding contract administration and application.

Clause 16, in particular, is a good example of the drive within the NEC to resolve problems as they arise. It makes provision for an early warning system, containing a notification followed by a meeting to resolve *"...any matter which could increase the total of the prices, delay completion or impair the performance of the works in use."*

Risk Apportionment and the Treatment of Risk in NZS3910, NEC and FIDIC

Bunni⁷ identifies four main areas where risk in construction occurs, and links these areas to clauses found in the previous FIDIC Red Book, i.e. the Fourth Edition of 1987. The classification Bunni advances is still valid; the risks he typifies are:

- the risk of injury or damage (personal and material);
- the risk of non-performance;
- the risk of delay in performance of the contract; and
- the risk of cost over-run in the performance of the contract.

In the light of the Bunni definitions, this section examines the treatment of such risks in the NEC, the FIDIC new Red Book, and NZS3910, and some of the major differences between the contracts.

⁷ Nael G Bunni, *The FIDIC Form of Contract — The Fourth edition of the Red Book*, Blackwell Science, Oxford, UK, 1991.

The Risk of injury or damage (personal and material)

The Risk and Responsibility Section 17 of the FIDIC construction contract covers the ‘Employer’s Risks’ (clause 17.3) and ‘Consequences of Employer’s Risk’ (clause 17.4). These outline the general contract risks assumed by the Employer during construction. However, other clauses refer to other more specific areas of risk. For instance, regarding the Employer’s Equipment, clause 4.20 states that:

“...the Employer shall be responsible for the Employer’s Equipment, except ... whilst any of the Contractor’s personnel is operating it, driving it, directing it or in possession or control of it.”

Although this is a statement of *responsibility*, it implies the inherent risk for the Employer, if its equipment on site causes injury or damage.

The Contractor’s risks of injury and property damages arise from various specific provisions of the FIDIC form, and from the Contractor’s general responsibility for the Works. The contractor takes full responsibility for Care of the Works, as specified in clause 17.2. More specific provisions dealing with injury or damage can be found in Section 4 - The Contractor. Its clauses that deal with Safety Procedures (4.8), Contractor’s Equipment (4.17), Protection of the Environment (4.18) and Electricity, Water and Gas (4.19) are relevant, as they all have an element of risk associated with them. Health and safety of personnel is covered in Section 6 (Staff and Labour): clause 6.7 details the precautions the contractor must take to protect people from injury. By implication, failure to meet those requirements is an inherent risk of the Contractor.

Risk of injury is covered in NEC clause 18.1. The guidance notes on this clause refer to “...laws which place considerable responsibilities upon employers, employees and others in relation to health and safety” and suggests that the specific health and safety requirements to be complied with by the parties should be specified. Wider reference to the risk of injury or damage is also made in other sections of the NEC. Section 8 has clauses specific to Risks and Insurance. Clause 80.1 deals with the Employer’s Risks and clause 81.1 deals with the Contractor’s Risks, which are defined with a blanket statement: “*From the starting date until the Defects Certificate has been issued the risks which are not carried by the Employer are carried by the Contractor*”. The NEC Guidance Notes relating to sub-clause 80.1 identify six main categories of Employer’s risks, some of them specifically linked to injury or damage: risks of the Employer’s use of Site of Works; the Employer’s general or legal responsibilities and faults in design; loss of or damage to works, plant or materials outside the parties’ control; risks arising once the Employer has taken responsibility for the Works; loss or damage to equipment remaining on site after termination; and any additional risks that are stated in the Contract Data. The NEC guidance notes recommend ways of dealing with these risks primarily, although not exclusively, through the use of different insurances.

Reference to law, but not specifically to health and safety, is also found in NZS3910.

Sub-clause 5.11.1 requires compliance with all statutes, which therefore must include the Health and Safety in Employment Act (1991). However, clause 5.7 specifically deals with protection of persons and property and provides similar clauses to those found in NEC and the FIDIC documents with regard to health and safety. Clauses associated with risks of damage are also found in the Section 5 - General Obligations. Clause 5.6 deals with the care of works, with sub-section 5.6.5 detailing the excepted risks which are similar in content and wording to the Employers risks in the FIDIC construction contract (sub-clause 17.2).

Whether by specification or inclusion, all three forms deal with the risks of injury or physical damage. The brunt of the responsibility for catering for those risks falls with the Contractor in most cases. Regarding the applicable laws, contract forms may be silent or explicit; however, it is a universal tenet that ignorance of a law is no excuse for non-compliance. When operating in an unfamiliar country or business environment, contractors must obtain legal advice regarding the laws applicable to risks of injury, causing health problems related to site conditions, or damage to property or the environment, apart from those applicable to the design or construction activity per se (e.g. NEC 21.2).

Risk of non-performance

The risk of non-performance is usually dealt with by the clauses on default. The FIDIC New Red Book deals with default by the Contractor in Section 15 - 'Termination by the Employer'; and default by the Employer under Section 16 - 'Suspension and Termination by the Contractor'. The Employer is entitled to terminate the works through default and other reasons (such as bankruptcy). The default reasons listed are: not providing a performance security, not complying with a notice to correct, abandoning the works, failing to proceed with the works or put right defects, and subcontracting the whole of the works. The Contractor, for his part, is entitled to suspend work or terminate the Contract, if the Employer defaults through actions such as failure to certify, issue payments, or perform obligations specified in the Contract.

Among the contract obligations that may give rise to the risk of non-performance caused by Employers, these can refer, for instance, to non-availability of the site of works, or impediments to access (FIDIC clause 2.1); failure to assist in procuring permits and licenses (FIDIC clause 2.2). Employers should be particularly wary of making available to the Contractor any equipment or materials (FIDIC clause 4.20): delays or defects on these form part of the risk of non-performance. This matter is dealt with in NEC in clause 80.1 and in NZS3910 in clause 5.16. It should be noted, however, that NZS3910 refers only to "*Late Supply by Principal*", without reference to quality, or the consequences of providing defective equipment or materials that do not conform to specifications.

Clauses 94 and 95 of the NEC deal with termination of the project through default of the Employer and Contractor, respectively. Sub-clauses 95.2 and 95.3 list mostly similar reasons, although worded differently, to the FIDIC form, for termination

due to default by the contractor, with the addition of a health and safety requirement: the Contract may be terminated if the Contractor has substantially broken a health or safety regulation.

In NZS3910, Section 14 deals with Frustration and Default. The reasons for default by the Contractor are similar to those listed in NEC and FIDIC: failure to execute the contract agreement or the contractor's bond, subletting the whole or substantially the whole of the works without the consent of the principal, abandoning the contract or failing to carry out the contractual obligations. Default by the Principal (sub-clause 14.3) covers similar default reasons as those given in FIDIC, such as failing to execute contract agreement, failing to pay, obstructing the issue of certificates, abandoning the contract, and failing to carry out contractual obligations.

NZS3910 does not list specific events beyond the control of the parties that may lead to frustration of the contract. It leaves it to the parties to claim that "*the contract has become impossible of performance or has been otherwise frustrated*", followed by mutual agreement or resorting to the disputes resolution channels. The FIDIC Conditions deal with Force Majeure and its consequences (Section 19) and the NEC under Clause 95.

All three forms, NEC, FIDIC, and NZS3910 refer to the risk of non-performance due to bankruptcy and liquidation of the Contractor. One particular hazard creating a potential risk of non-performance is the failure of the Principal to pay for the Contractor's work. NZS3910 contains a provision for a bond to be furnished by the Principal, guaranteeing contract payments (Clause 3.2, 'Principal's Bond'). In theory, this clause should provide adequate protection to the Contractor. However, in times of economic stricture, when work is scarce, it is hard to see how any contractor could insist on retaining such a clause in the contract. Likewise, government departments or large industrial and commercial corporations would probably be averse at including the clause, for obvious reasons. FIDIC includes a clause equally meant to protect the Contractor: 2.4, 'Employer's Financial Arrangements', which specifies that within 28 of signing the Contract, the Employer shall submit "*reasonable evidence that financial arrangements have been made and are being maintained which will enable the Employer to pay the Contract price...*" In turn, this provision may prove to be a piously hopeful statement, since it is qualified by the word 'reasonable'. This term and similarly vague words used in traditional contract drafting can be the cause of disputes and often had to be referred to the interpretation of a judge, after the parties have differed in their own interpretation of reasonableness. NZS3910 also still follows tradition — for example, when providing for the payment of interest to the Contractor when there occurs "*an unreasonable delay in the issue of a certificate...*" (clause 12.7, 'Interest'). This implies that any specific term provided for in the Contract for the issue of certificates is not necessarily a binding obligation of the certifier, who can still apply 'reasonableness' to his or her performance.

The drafters of the NEC have avoided the traps of those traditional ambiguous

terms for the most part. However, some terms which may still be subject to interpretation by the Adjudicator or a court of law remain in NEC — for instance, “insufficient” and “unnecessary”, among the sub-clauses of the *Compensation Events*. However, clause 17 is designed to manage such problems, by dealing specifically with *Ambiguities and Inconsistencies* in the Contract as soon as they are identified. Only if the Project Manager’s determination of the ambiguity or inconsistency is not acceptable to one or both parties would the matter be referred up to the Adjudicator.

FIDIC is an international form of contract, whose previous issues have been adopted by the international development banks within their standard bidding documents. Since the banks lend primarily to governments which have sovereign rights, FIDIC has now adopted in its contract form the right of the Employer to “*terminate the Contract, at any time for the Employer’s convenience...*” This provision had been included hitherto by the banks within the Special Conditions, but is now enshrined in the core clauses of FIDIC, and the inherent risk merits consideration by companies embarking into contracts in areas of political or economic instability.

The risks of delay in performance of the contract and cost over-runs

Bunni⁸ identifies mechanisms for dealing with delay in performance and cost overruns. The first stage is to establish the claims and counterclaims that are likely to occur that could cause either event (lateness or extra cost) to happen. Bunni suggests that:

“Claims will very often arise in a traditional construction contract because it is perhaps the only contract where the price of the end result is defined before the process of ‘production’ event starts”.

He then goes on to say that:

“...little or no margins are left for future unknowns in a long and complex period of construction...any change between what was assumed and what actually happens may form the seed for a claim.”

Bunni categorises the claims for dealing with delay in performance and cost overruns into claims arising out of the contract, based on a specific remedy as a result of a specific event, which may or may not be a breach; claims under the law of torts; claims where no contract exists; and ex-gratia claims (i.e., “*where there is no legal basis but rather some commercial sense in making a payment*”).

Contracts must assist in dealing with delays and cost overruns arising from specified events. Clauses in the NEC, FIDIC and NZS3910 deal with extensions of time, variations (or “*change of work information*” and “*compensation events*” in the NEC), and liquidated damages. FIDIC and NZS3910 use conventional ways of dealing with variation claims (under Section 13 for FIDIC and Section 9 in NZS3910) whereas NEC uses a different approach (defined in Clause 6, Compensation Events).

⁸ See footnote 7.

In FIDIC and NZS3910, the sections follow a similar pattern, containing the right to vary (or “*variations permitted*”), variation procedure, and valuation of variations. In the FIDIC form, the Section on Variations and Adjustment includes sub-clause 13.2 (“*Value Engineering*”) which gives an option for the Contractor to submit proposals to accelerate completion, reduce costs, improve efficiencies or otherwise propose design or constructability improvements that would benefit the Employer. NZS3910 does not contain such a clause, but does have provisions for a bonus for early completion (under sub-clause 10.6), thus creating an incentive to speed up construction.

The approach to variations and extensions of time in the NEC is covered by Section 6, “*Compensation Events*”. Sub-clause 60.1 contains a list of eighteen events deemed to be ‘compensation events’, some of which are traditionally listed as causes of variations, as in FIDIC and NZS3910: for example, changing the works information (60.1.1) and unforeseen physical conditions (60.1.12).

However, for the most part the structuring of the ‘compensation events’ is aimed at removing ambiguity by listing specific events that may delay the contractor’s progress, such as 60.1.3, failure of the Employer to provide something required; 60.1.8, a Project Manager’s or Project Supervisor’s change of decision; or 60.1.11, an inspection or test by the Supervisor that causes unnecessary delay.

For the most part, the ‘compensation events’ listed in the NEC are dealt with under NZS3910 Section 10 (sub-clause 10.3 “*Extensions of Time*”) or FIDIC Section 8 “*Commencement, Delays and Suspension*”, particularly clause 8.4, “*Extension of Time for Completion*”. However, these contracts are not as explicit as the NEC, and therefore can provide avenues for potential disputes of interpretation of what constitutes an event leading to an extension of time. The explicit listing of events in the NEC is a tool for the prevention of disputes.

Other causes of delay, possibly leading to cost overruns, listed in FIDIC are: measurement changes, adverse physical conditions, hazards resulting in Employer’s risks, compliance with statutes, price and currency fluctuations, defects and unfulfilled obligations, suspension, commencement and delays, release from performance, default and termination. In terms of early warnings for delays or cost overruns there are requirements in NEC, FIDIC and NZS3910 to provide programmes and updating them, as found in clause 31, “*The programme*”, in NEC, clause 8.3 “*Programme*” in FIDIC, and clause 5.10, “*Programme*” in NZS3910.

The “*Early Warning*” provisions in Clause 16 of NEC also prescribe early warning meetings at which participants should endeavour to solve time and cost problems quickly and as they arise, in a spirit of collaboration. FIDIC clause 8.3, “*Programme*”, and NZS3910 clause 5.10 deal with handling delays following more traditional approaches.

The Principal’s Risks in NZS3915

It should be noted that, when the Principal accepts direct responsibility for managing

the Contract, as is implied in NZS3915, some of the responsibilities for dealing with risks that could be transferred to a supervising professional (such as The Engineer or the Architect), under provisions of due diligence in their own Agreements, are directly assumed by the Principal.

Indemnities and Insurances

The following is a short summary of the provisions for dealing with particular hazards, and the arrangements in the various contracts in the indemnities and insurance clauses. In the FIDIC construction contract, indemnities are covered in clause 17.1 under the Section on “*Risk and Responsibility*”, whereas insurance is covered in clause 18. The NEC covers these matters under Section 8, “*Risk and Insurance*” and NZS3910 deals with “*Indemnity*” in Section 7 and “*Insurance*” in Section 8.

The most straight-forward analysis of the insurance requirements in a contract can be found in the NEC, whose clause 84.2 includes a table explaining what risks need to be insured against, as well as the minimum amount of cover or minimum limit of indemnity required. This is an example worth considering by drafters of standard forms. The NEC also contains provisions referring to insurance policies (clause 85), consequences of the Contractor failing to insure (clause 86), and insurance by the Employer (clause 87).

Both FIDIC and NZS3910 include detailed provisions pertaining to the indemnities and insurances required from the contractor. FIDIC contains clauses on *General Requirements for Insurances* (clause 18.1), *Insurance for Works and Contractor’s Equipment* (clause 18.2), *Insurance against Injury to Persons and Damage to Property* (clause 18.3) and *Insurance for Contractor’s Personnel* (clause 18.4). The insurance provisions of NZS3910 are subject to review (as shown in DZ3910) but currently contain contractor’s insurance requirements for contract works and materials, contractor’s plant, public liability risks and general insurance. NZS3910 also provides for the Principal to insure the Works and against Public Liability in certain cases.

The Treatment of Disputes in FIDIC, the NEC, and NZS3910 and 3915

The dispute clauses in all the contracts prescribe the procedures following a disagreement between any of the parties, and the event of a dispute. These vary between the nomination of a neutral party, the provision of a mediator, and resorting to arbitration. FIDIC covers these matters under Section 20, “*Claims, Disputes and Arbitration*”; the NEC in Section 9, “*Disputes and Termination*”, and NZS3910 in Section 13, “*Disputes*”.

The New Zealand Forms

The first stage to solving a dispute under NZS3910 is the Engineer’s review. The Engineer in this capacity is required to be working independently of the Principal

and Contractor, assessing the merits of the dispute, and giving an independent decision. This places the Engineer in a difficult professional position, particularly when the dispute is about valuation and certification of the Contractor's work, functions that have been performed by the same Engineer. Clause 13.2 details the process for the "*Engineer's Review*". In sub-clause 13.2.1, the Engineer is required to give a decision in writing on any difference or dispute, and can modify it if deemed necessary, unless it becomes "*final and binding*" under Clause 13.2.4. However, see the discussion of this last sub-clause below.

Under 13.2.2, the contract provides for the Engineer and the Contractor to meet and try to solve a dispute 'amicably'. At this stage it is not clear what the role of the Engineer is, i.e. acting on behalf of the Principal (and therefore more likely to view the dispute from the principal's side), or independent of Contractor and Principal as a pseudo-mediator (and therefore expected to try and come up with a compromise situation).

However, in 13.2.3, the dispute can, with the consent of the Principal, be submitted to an agreed expert "*...with a request to make a recommendation to assist them to resolve the matter*". It is assumed from this that the Engineer is now acting on behalf of the Principal, submitting the Principal's side of the dispute to the expert or (taking a perverse interpretation of this procedure) on his own behalf, if the dispute refers to a decision by the Engineer.

Sub-clause 13.2.4 makes reference to a '*formal decision*' given to the Principal and Contractor by the Engineer: here the Engineer is acting in an independent capacity. However, the same sub-clause refers to the parties "*...awaiting a recommendation from the agreed expert...*" without a setting a limit to the time the 'expert' can spend considering the problem and issuing a recommendation. This could extend the time the conflict has been festering, thereby deepening any problems and animosity between the parties. It has been argued that, if the expert does not come up with a decision, the parties (Principal and Contractor) can refer the matter back to the Engineer. In short, back to square one, and start again.

A further problem of sub-clause 13.2.4 is the determination of the Engineer which becomes "*final and binding*", *subject to 13.3 and 13.4*. These clauses refer to Mediation and Arbitration, respectively. It follows that the Engineer is not empowered to issue 'final and binding' decisions.

The above discussion suggests that there is room for improvement in the dispute resolution section of NZS3910. Perhaps the drafters should consider including a 'neutral' within the contract, as a means of dispute *prevention*, rather than *resolution*, which implies that the dispute has been allowed to arise and possibly fester. Indeed, after the Engineer's determination, and the good offices of the 'expert', the procedure moves straight to mediation and arbitration. In other words, persons strange to the Contract are brought in to assist in resolving an

issue in a project that may have been running for some time. Apart from having to bring these external mediators or arbitrators ‘up to speed’ with the development of the Contract, there may be special circumstances in its execution which may be well known to some of the participants, or may have been forgotten or not recorded, and could have direct bearing on the problem.

In NZS3915, the Engineer is no longer part of the Contract. The dispute must therefore be referred to a third party, an *expert* who is “...a suitably qualified independent person appointed by agreement of the parties.” Sub-clause 13.2.2 provides the mechanism for appointing such an expert. It states that:

“The Expert may be appointed before work commences ...or at any time during the carrying out of the Contract Works...appointed generally for all disputes...or specifically for any particular dispute.”

The expert is expected to act fairly and impartially, provide a decision in writing, with reasons for the decision, if requested. Since NZS3915 has been formulated for generally smaller contracts of relatively short duration, where supervision by the Principal may be possible, in this case the flexibility provided for appointing the expert “*generally or specifically*” is warranted. However, if there is a case for appointing the expert *generally for all disputes*, it would be wise to require him or her to visit the site at specified regular intervals and wherever a problem or change in circumstances arises.

FIDIC and the NEC

There is a different first stage mechanism for solving disputes under the FIDIC construction contract. Under the New Red Book, the Engineer is no longer part of the dispute resolution process, as in previous versions of FIDIC. Under clause 20.1 the Engineer is required to provide a decision on the contractor’s claim. If the Engineer declines the claim, the Engineer must provide detailed comments. Subsequent to this statement, there is no provision for the Engineer correcting or modifying a decision, as in NZS3910. The next step is to refer the settlement of a dispute to a *Dispute Adjudication Board (DAB)*, a neutral person or panel appointed *ab initio* to act throughout the execution of the project.

The reason for the removal of the Engineer from the dispute resolution process in the FIDIC contract form is suggested by Booen and Jaynes.⁹ They point out that:

“Dispute (Review) Boards have been in use world-wide since 1995 on projects receiving financing from the World Bank and the Asian Development Bank. They are a major change from the older practice of using the Employer’s Engineer as the maker of pre-arbitral decisions...”

Further comments about the replacement of the Engineer in the process can be

⁹ Booen, P L and Jaynes, G L, *The FIDIC 1999 Forms of Contract*, published electronically by FIDIC: www.fidic.org/resources/contracts (2001).

found in a paper by Seppala.¹⁰ When discussing the difference between the new FIDIC conditions of contract and the old conditions of contract, Seppala points out that “*The provision for the DAB to replace the engineer for the settlement of disputes ...may be the most favourable of the innovations in the new Books from the contractor’s point of view*”. One may also add the Employer as a beneficiary, since the expeditious resolution of disputes directly affects the successful completion of a project.

Clause 20.2 of FIDIC requires disputes to be submitted to the board for a decision. The DAB is formed by either one or three suitably qualified persons. If a panel of three, each party nominates one member and the third member is mutually agreed upon by the parties. The DAB is appointed at the beginning of the contract and remains in place until the contract is completed. Clause 20.3 outlines the procedure for appointment of the DAB member(s), and clause 20.4 the mechanism to be followed by the Dispute Adjudication Board to reach decision.

The FIDIC form draws attention to the role of the DAB, stating that “*...the Dispute Adjudication Board acting as a panel of expert(s) and not as arbitrator(s), shall give notice of its decision to the parties*”. If the parties are dissatisfied with the decision then they move to the next stage of dispute resolution, which is “*Amicable Settlement*” (clause 20.5) and, failing this, Arbitration.

Adjudication by a *neutral* is also part of the first stage of the dispute resolution process under NEC. A dispute under the ECC option is submitted to an *Adjudicator*. The Adjudication Table in clause 90.1 outlines a mechanism for submitting a dispute to the adjudicator. For instance, if the dispute is about an action of the Project Manager or Supervisor, then the Contractor may submit the dispute directly to the Adjudicator. This differs from NZS3910 where the dispute may be submitted to an expert “*...with the consent of the Principal...*”.

The NEC states that:

“It is the intention that all disputes should be resolved by an Adjudicator who is jointly appointed by the Employer and Contractor and is able to act independently.”

The adjudicator in the NEC is appointed at the beginning of the project and named in the Contract Data, thus becoming one of the project participants, in so far as they are available to resolve any dispute as it arises. The adjudicator is there to make a “*...quick decision where the parties are unable to agree*”.

There is a considerable difference in the approach followed in the appointment of an external expert in FIDIC and the NEC, and NZS3910: whereas in the former the neutral(s) are appointed *ab initio*, the New Zealand standard provides for the use of ad-hoc experts when particular disputes occur, meaning that the person must first become acquainted with the project and the nature of the dispute.

¹⁰ Seppala, C R, *FIDIC's New Standard Forms of Construction Contract: an Introduction*, published electronically by FIDIC: www.fidic.org/resources/contracts (2001).

Further steps

The NZS3910 and 3915 provisions require the dispute to be referred to Mediation after a recommendation of the ad-hoc expert has failed to resolve the dispute. Sub-clause 13.3.3 sets out the role of the Mediator, who must “...*discuss the matter with the parties and endeavour to resolve it by their agreement.*” This sub-clause also has an important provision requiring that “*All discussions in mediation shall be without prejudice, and shall not be referred to in later proceedings.*” Should the mediation fail, the dispute then escalates to the next step, Arbitration (clause 13.4). The arbitration award is final and binding.

The provision of Mediation as an intermediate step is a major difference with both the NEC and FIDIC, which proceed to arbitration if the recommendation by the Adjudicator or DAB is not accepted by the parties. However, FIDIC clause 20.5 refers to an ‘amicable settlement’: if there is dissatisfaction with the DAB’s decision, then “...*the parties shall attempt to settle such dispute amicably before the commencement of arbitration*”.

The NEC makes reference to review by a *tribunal*, whether arbitral or the courts of law. The guidance notes state that:

“The Employer must choose and insert in the Contract Data the tribunal which will settle a dispute if either party does not accept the Adjudicator’s decision. The choice will either be arbitration or the courts.”

However, the guidance notes further state that:

“...if arbitration is available under the law of contract ...it is strongly recommended that arbitration is chosen”.

The guidance notes continue by pointing out that:

“The rationale for arbitration remains important particularly for disputes upon technical matters for which an arbitrator experienced in the technical context of the dispute is preferable to the courts”.

NEC and FIDIC provide that the recommendations of the Adjudicator and the DAB (respectively) can be used as evidence in the arbitration process. For instance, FIDIC clause 20.6 states that:

“The arbitrator(s) shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, and any decision of the DAB, relevant to the dispute.”

NZS3910 and 3915 provide for the arbitrator to “*open up, review, etc. ...*” the decisions and determinations of the Engineer, but the arguments put forward by the parties to the Engineer, and the proceedings of the mediation shall remain confidential, vis-a-vis the arbitrator.

The Future for New Zealand Standard Conditions of Contract

As mentioned previously, a review of NZS3910 is currently (July 2002) being undertaken and the draft document, DZ3910, is available for public comment. According to the drafters, the revised 3910 document “...is largely in response to industry concern about difficulties in obtaining insurance that complies with the standard and in obtaining certificates that confirm that the required insurance is in place.” (Standards New Zealand, 2002).

DZ3916 is a new standard contract form being developed for design and construct contracts for a ‘greenfields’ projects (similar to the FIDIC EPC/Turnkey contract). Standards New Zealand suggest that:

“...this form of contract has the ‘Principal’s requirements’ as its basic document. The Principal’s requirements may vary widely in the detail that they contain from being a brief concept description to a partially complete design. An optional provision provides for the Principal’s design consultant to become the responsibility of the Contractor by a process known as novation.”

(Standards New Zealand, 2002).

The development of new forms of contract in New Zealand in line with international contract forms, but developed for the local market using local knowledge, makes it hard to visualise that the use of a radically different form such as the NEC may become extended in the country. Although the NEC has many innovative aspects to recommend, the size of the New Zealand market and the development of local forms for particular New Zealand conditions make it difficult for an imported new form to have an immediate impact. This, together with the industry’s and the Courts’ understanding of tried and tested clauses of NZS3910, means that unless the benefits of the NEC can be clearly seen by the industry, the current contract forms (and their updated versions) are likely to continue to be in general use. However, with the increasing internationalisation of the construction industry and new approaches such as alliancing and partnering, which require different forms of agreement, New Zealand contract forms will need to be developed to adapt to the changing situations and incorporate similar flexible arrangements currently found in NEC.

Against this reasoning, we must not lose sight of the fact that the genesis of NZS3910 has, in essence, followed the development of the British models, notably the Institution of Civil Engineers’ Conditions of Contract, which have also been the basis for the international forms issued by FIDIC. Will there be a case for the NEC, a pioneering new form also produced by the same Institution, eventually becoming a model for a revolutionary new series of New Zealand standard forms?

Conclusion

This chapter has provided a comparison of the standard mechanisms available for contract administration in New Zealand (contract forms issued by Standards

New Zealand) and the new forms published by the Institution of Civil Engineers (the NEC) and the International Federation of Consulting Engineers (FIDIC). Particular focus has been given to the treatment of risk and the differences and similarities in the dispute resolution processes. Whilst all contract forms treat the basic contract principles, and deal with risk distribution and treatment in similar ways, the major differences arise in respect of (a) language and presentation, where the NEC has marked a significant departure from the traditional models, and (b) the *prevention* of disputes, which is provided for in FIDIC and NEC, but not so in the New Zealand standards, that rely on the *resolution* of disputes, i.e. an *ex-post* approach. It is this last feature which would be a desirable improvement to be introduced in the NZS forms.

8

New Opportunities Through Culture Change

compiled by **Jason Le Masurier**

Abstract

The first part of this chapter examines the current cultural environment of the construction industry, and reviews the changes of attitude that are necessary for the industry to progress, from stances of confrontation and adversarial relationships, to a culture of collaboration and mutual gain. The text draws from papers presented by Martin Barnes, Nael Bunni and William Stockman at the Conference on *The Contract in Successful Project Management*, in Christchurch, February 2002, and from other sources, notably the Rethinking Construction report of the UK government.

Starting from a concept of levels of maturity or enlightenment in the industry, the chapter considers the various ways that the industry is moving towards a more integrated approach and the benefits that accrue from this. The main focus is on partnering, covering the definition of the term, the mechanisms by which it is commonly promoted through contracts and partnering charters and the importance of the project culture in making it work. An advanced form of partnering, based on relational rather than transactional contracts, is also presented.

The transition from adversarial relationships to the ideal of partnering is to some extent evolutionary and this chapter considers some of the blocks to partnering and alternative methods of procurement that can be considered steps on the path, all of which involve a degree of integration of processes and teams. This covers for example joint ventures and the various forms of design, build, finance and operate. Finally, the first part of the chapter considers how culture change or evolution can be facilitated using the example of the Rethinking Construction initiative in the UK.

The first part of the chapter is put into practical context with a paper written by Tim Wood, Deputy Project Manager for the Tamar Bridge Widening. This paper followed from a presentation given by Wood at the CAE Rethinking Construction meeting in Christchurch in March 2002 and is a frank example of how partnering under the New Engineering Contract works in practice. It covers the entire process from the early decisions, through selection of designer and contractor and working with the whole supply chain during design and construction. Wood's paper emphasizes some of the key issues for consideration when partnering and highlights the influence that an enlightened client can have over the successful outcome of a project.

Examples of Partnering Agreements, prepared by Nael Bunni, are given at the end of the chapter.

Culture Change

Jason Le Masurier

Introduction

In the past, many construction projects have been dogged by adversarial relationships and this type of culture still has a strong influence in the industry. However, there is currently a steady move towards collaborative relationships. Working collaboratively, rather than confrontationally, opens up new opportunities and will clearly improve results in terms of project time, cost and job satisfaction for those involved.

Independent or Interdependent?

As the construction industry has matured in certain countries, so the relationships developed on construction projects have matured. A model of relationships that helps describe the change is given by Covey.¹ His model is a 'Maturity Continuum' that moves from dependence to independence and on to interdependence. Covey says that on the maturity continuum, dependence is the paradigm of you – 'You take care of me' or 'I blame you for the results'. Independence is the paradigm of I – 'I can do it', 'I am responsible'. Interdependence, Covey says, is the paradigm of we – 'we can do it; we can co-operate we can combine our talents and abilities and create something greater together'.

Covey asserts that *"The current social paradigm enthrones independence. It is the avowed goal of many individuals and social movements ... as though communication, teamwork, and co-operation were lesser values ..."*

On partnerships and agreements Covey says *"Traditional authoritarian supervision is a win/lose paradigm"*. Partnership agreements shift the paradigm of productive interaction *"from positioning to being partners in success."* However, he also points out that: *"An agreement means very little in letter without the character and relationship base to sustain it in spirit. So we need to approach win/win from a genuine desire to invest in the relationships that make it possible ..."*

Traditional forms of contract generally regard each party as independent. This is based on the assumption that if role, responsibility and risk requirements are clearly assigned to each party, and each party complies with their allotted requirements, then the project will be successful. However, this model has been proved to be inappropriate for all but the most simple of construction projects. The various parts of a project cannot be successfully carried out by separate parties in isolation from each other, but rather there needs to be integration and feedback at all stages. The interdependence of construction project processes and the construction supply chain is recognized in certain industry sectors, and among some of the larger clients and contractors in countries that have a well-developed construction industry.

¹ S R Covey, *The Seven Habits of Highly Effective People*, Simon and Schuster, London, 1992.

It is the transition from an independent to an interdependent attitude that defines the current industry culture change. Once a supply chain or industry sector has reached this level of maturity, there arise significant opportunities to adopt performance-improving strategies, including, for example, lean construction (see Box 5). A fundamental indicator of the maturity of the industry can be found in the type of agreements used by the parties and the extent to which they promote interdependence.

Design and build contracts could be considered the first stage in recognition of interdependence — they promote the integration of design and construction. However design/build can break down into adversarial relationships between a contractor and its sub-contract designer. True interdependence relies on teamwork — which is generally referred to as partnering. Partnering agreements range from traditional forms of contract with partnering charters attached, to contract forms based on partnering and, ultimately, agreements to work together for mutual benefit without reliance on formal contracts.

It is worth emphasizing that the recognition of interdependence is not new. Today, and throughout the history of construction, when the people involved in a project are sufficiently mature and experienced, they will generally work in a spirit of cooperation to some extent, regardless of the form of contractual arrangement. However, in the absence of enlightened people who recognize the mutual benefits of collaboration, the type of contractual arrangement can have a significant effect on the relationships that develop. The contract effectively ‘sets the scene’; if it is fair and equitable then people will be encouraged to work together; if it is divisive then people can be unwittingly led into conflict. This concept is developed further in Chapter 4.

Challenging the obligation paradigm

In reviewing contract relationships, Stockman² pointed out that contracts are all about obligations, with a good contract clearly defining each parties obligations in simple terms, without ambiguity, so that at contract completion both parties achieve a ‘win’ in terms of results. However, he suggested that reality typically falls well short of this objective, due to the inadequate structures and relationships that underpin the various components of the contract, and a lack of clarity over the scope of each party’s obligations. The current tender and contract paradigm focuses on obligations and risk transfer, and often results in a ‘win/lose’ or even a ‘lose/lose’ result, not only for the owners and companies involved but also for individuals and their families.

Stockman proposed that instead of hardening and complicating the obligation side of tendering and contracts we should consider a new paradigm that strives to consistently achieve ‘win/win’ results — through contracts that:

- rely on simple terms and conditions;

² William Stockman, “Challenging the obligation paradigm in contracts” – presented at the CAE *Conference on the Contract in Successful Project Management*, in Christchurch, February 2002.

- share risk and reward so that sponsors, advisors and delivery companies share incentives;
- encourage innovation, cooperation and teamwork;
- achieve better value for money; and
- encourage the building of strong long-term business relationships.

Stockman illustrated his point by comparing the common current practice of tendering and contracting and the associated outcomes – with simple human desires and objectives that we all strive for in everyday life, as shown in Table 1.

What do we really want to achieve?	Under the ideal contract I would have:	Under many forms of contract I actually have:
Health, family, job satisfaction, personal life	Good health, enjoy the journey, success and job satisfaction, have time to spend with family and friends, some adrenaline highs, time to relax	Poor health, sleeplessness, stress, significant amounts of overtime, no time for family and friends, no time to relax, no enjoyment – "a tough industry"
Profit	Make a fair and reasonable profit – invest in the future of my company, profit share with employees	Skippy profit at best, often a loss or less than necessary to cover overheads, under resourced projects and sometimes bankruptcy
Relationships	Build long term friendships and business relationships	Conflict /Dispute – Inefficiency from the outset
Administration	Efficient / simple	Inefficient / costly – numerous onerous requirements
Expectations	Exceed expectations 'win/win' results	'win/lose' or 'lose/lose' results

Table 1: Ideal vs adversarial contract management (after Stockman)

Partnering

Definitions

The better and more successful firms are increasingly using partnering in place of traditional contract-based procurement and project management. Partnering has been defined as:³

“...two or more organizations working together to improve performance through agreeing mutual objectives, devising a way for resolving any disputes and committing themselves to continuous improvement, measuring progress and sharing the gains.”

³ *Rethinking Construction – Report of the Construction Task Force*, Department of the Environment, Transport and Regions, 1998, HMSO, London.

Another term often used is alliancing. Some people have used the name alliancing to mean longer-term strategic relationships between two commercial undertakings. However, following Barnes' suggestion⁴ that this usage has by no means gained wide acceptance or official recognition, the word partnering is used here, in preference to, albeit synonymous with, alliancing.

Barnes described the various types of partnering arrangement between construction parties. The simplest form of partnering is where client and contractor agree to work together collaboratively in the course of one project. The relationship is used only once.

The next level of complexity is when more than two organisations agree to work together on a single project. The extreme of this type of partnering is when all the organisations working on one project agree to work collaboratively. This is the most comprehensive type of single-project partnering arrangement. It is sometimes called multi-interface partnering to distinguish it from single-interface partnering, which involves only two organisations.

Multi-project partnering is the next level of complexity when two organisations agree to work together over a series of projects or over a period of time that encompasses a number of projects. Multi-project partnering can be single-interface or multi-interface in the same way as single-project partnering. Multi-project partnering is sometimes called programme partnering and sometimes framework contracting.

Continuous improvement was highlighted by Barnes as a particularly desirable characteristic of multi-project partnering, following from its long-term nature. There can be, and usually is, an obligation on both parties to look for continuing improvement in delivery of the service that the supplier is contracted to provide. This requires that there should be some method of assessing performance and, thereby, measuring improvement, achieved through Key Performance Indicators (KPIs), which are usually interim measurements of performance. However, Barnes warned that if such KPIs are not agreed upon and observed, and there is lack of care and diligence by one or more of the partners, complacency and diminishing positive results can set in and destroy the very essence upon which partnering rests.

Barnes described the difficulty associated with a contract tailored to administer a series of projects over a long time, in that it often cannot be based upon a precise specification of the work to be done in later stages. This has given rise to the variant of the long-term partnering contract called the 'Framework' contract, when a supplier contracts with a client to do a series of projects, in which the exact nature of the work to be done is not identified but a pricing arrangement is agreed upon, on which the parcels of work will be valued as they emerge. In the UK, local and national authorities are increasingly using framework agreements

⁴ Martin Barnes, "Partnering, Alliancing and other Collaborative Approaches" – presented at the CAE *Conference on the Contract in Successful Project Management*, in Christchurch, February 2002.

for highway, city and utility maintenance.

Partnering and culture

The desire to use the partnering approach, and the presence of the environment in which it will work are a ‘chicken and egg’ conundrum. As mentioned previously, successful partnering relies on the culture of collaboration being in place — conversely, the culture can be promoted by the use of partnering agreements. For example, a client may award a traditional construction contract to a builder, who then establishes partnering arrangements with sub-contractors and suppliers. The client may then be brought into the partnering arrangement through the culture change on the project. An example of this situation occurred on the UK West Coast Mainline, as described by Barnes in Box 1.

The opposite situation occurs when the desire to use partnering changes the culture. For example, public sector clients in the UK are increasingly resorting to partnering arrangements. Contractors are short-listed for contracts on the basis of their track record as efficient ‘partners’. Quality assessments of tenders then ensure that the contractor with the best track record of working collaboratively is selected. This approach is contributing to a radical change in the culture of the whole industry — those who cannot work in a collaborative way will eventually not win any new work. The Tamar Bridge case study at the end of this chapter illustrates this point, as does the example given by Barnes in Box 2.

Box 1: The West Coast Main Line (Barnes)

This is the main railway from London to Glasgow. There is a very expensive and long-term programme for rebuilding the railway to carry more traffic and much faster trains. Work has begun at the southern end at Euston Station in London. Perhaps the most important first project was the reconstruction of the track and signalling from Euston itself. This was a highly complex project made particularly complicated by the need to maintain the rail traffic during all the time that the railway was being rebuilt and resignalled.

The project was begun with traditional contracts. The client used two principal directly-appointed contractors, one for the civil works and one for the signalling. After a while the two contractors decided to enter into a partnership with each other in order to facilitate getting the work done for their mutual client. After this arrangement had been in place for a while, the client itself joined the partnership. The partnership which, therefore, completed the project was a tripartite arrangement involving the use of the target cost type contract. The work was completed on time and within budget and was regarded as a great success by all the people concerned.

Box 2: Thames Water (Barnes)

Thames Water Company is the company that, amongst many other things, provides water supply for London and for the Thames Valley area and also disposes of the water for the same population. They have a very substantial capital programme, all of which is carried out using partnering arrangements.

For major single projects, they use single-project partnering together with target cost contracts. For smaller projects they use framework contracts, where they have a partnering arrangement with a contractor to carry out a programme of projects over a period of time in a particular area. The contractor's team works alongside the client's team in what is called a co-located project office. This is regarded as a very important characteristic of the working arrangements for partnering, by nearly everybody who uses this approach.

The third prong of Thames Water's capital programme consists of a large number of very small projects that are towards the maintenance end of their obligations. This work is done on very long-term multi-project partnering with heavy use of key performance indicators to reward continuous improvement and to maintain competitiveness.

Partnering contracts

It is generally accepted that, whilst partnering is based on a culture of trust and mutually beneficial relationships, it is necessary to underpin this relationship with a formal contract that clearly states the responsibilities of each party. To instil trust the contract should seek to allocate responsibilities logically to the relevant parties, without unfair onus on any one party. In addition the contract should be written so that all parties understand it — i.e. in plain language.

The New Engineering Contract (NEC) is a standard form of contract which embodies single-interface, single-project partnering as an option (see Chapter 6). It is now well-established and used for a very large proportion of the partnering contracts in the UK.⁵ A recently published supplement extends the NEC to cover multi-interface partnerships and multi-project partnerships.

PPC2000 is an alternative form of partnering contract developed by the Association of Consultant Architects and is considered to be the main potential rival to the NEC. The key features⁶ of PPC2000 are set out in Table 2.

Partnering the whole supply chain can be difficult to achieve; those at the lower

⁵ For further information on how partnering is achieved using the NEC and some interesting case studies see *NEC and Partnering – the Guide to Building Winning Teams*, by John Bennett and Andrew Baird. Thomas Telford Services Ltd, 1 Heron Quay, London, E14 4JD, UK, ISBN 0727729551.

⁶ David Mosey, *PPC 2000: First Standard Partnering Contract*, Trowers & Hamblins Solicitors (www.trowers.com/whats_new/PPC2000.htm).

Team-Based Multi-Party Approach	The Client, the Constructor and all Consultants and key Specialists sign a single Partnering Contract. This avoids the need for several two-party professional appointments and a separate building contract and/or partnering agreement, and substantially reduces Project paperwork. This single, integrated contract encourages a team-based commitment to the Project, and should reduce the temptation to hide behind unconnected two party agreements.
Integrated Design/Supply/Construction Process	Early selection of a Project Partnering Team and the collaborative finalisation of designs, prices and members of the supply chain encourages the contributions of the Constructor and its sub-contractors, suppliers and sub-consultants during the key period prior to start, as well as during supply and construction.
Key performance indicators	PPC 2000 expressly recognises the recommendations of "Rethinking Construction" and links these to the objectives of the Partnering Team on each Project. Achievement of these objectives is measured against agreed Key Performance Indicators.
Supply Chain Partnering	Finalisation of the supply chain on an open-book basis encourages partnering relationships with all Specialists, and includes provision for key Specialists to become full members of the Partnering Team. It is compatible with the wide variety of sub-contracts used by Constructors, but those sub-contracts must not conflict with the PPC 2000 terms.
Core Group	A Core Group of key individuals representing Partnering Team members operate an Early Warning system for problems and undertake regular reviews of progress and performance.
Controls	A Partnering Timetable governs the contributions of all Partnering Team members to partnered activities, including development of designs, prices and the supply chain, and a Project Timetable governs their activities after commencement on Site. Signature of the Project Partnering Agreement initiates the partnering process, with flexibility for the Constructor to undertake early work on Site under a Pre-Possession Agreement. However, all necessary Project details need to be finalised and agreed before the Partnering Team sign a Commencement Agreement authorising commencement of the Project on Site.
Incentives	PPC 2000 provides for agreement of Profit, Central Office Overheads with encouragement for Partnering Team members to agree shared savings and shared added value incentives. Payments can also be linked to performance against KPIs. Value Engineering and Value Management exercises are expressly recognized.
Risk Management	PPC 2000 provides a clear system for reducing, managing and sharing risks and for agreeing Changes openly and equitably. Risk management is a duty of Partnering Team members, and there is a facility to agree the balance of risk appropriate to each Project.
Non-adversarial Problem Resolution	A Problem-Solving Hierarchy is included of increasingly senior individuals within each Partnering Team member's organisation, working to strict time limits), with further reference of a problem to the Core Group. It also includes a facility for conciliation or other forms of alternative dispute resolution. These options are without prejudice to Partnering Team member's legal right to refer a dispute to adjudication.
Partnering Adviser	The Partnering Adviser is an individual with relevant experience who can guide the partnering process, who can document the relationships, commitments and expectations of Partnering Team members and who can provide an additional facility for problem resolution.

Table 2: Key features of the PPC2000 Contract (after Mosey, see footnote 6)

end can easily be omitted from partnering arrangements. However, suppliers of key components can play a significant role in a large contract, and any project management group considering partnering should carefully examine the whole supply chain, to ensure that no key participant is omitted (see the example of Terminal 5, Heathrow Airport as described by Barnes in Box 3).

Box 3: Terminal 5, Heathrow Airport (Barnes)

The client for this project is the company which owns and operates the main airports in the UK – BAA plc. The fifth terminal at Heathrow will be the largest new airport installation in the UK that has ever been built at one time. On its own, the terminal's passenger handling capacity will make it one of the largest airports in the world.

The project includes four buildings, comprising the new terminal, all the aircraft stands and taxiways, railway stations, car parks and all the other ancillary components of a modern airport terminal. Construction is about to start.

All the contractors and suppliers for Terminal 5 are appointed on partnering contracts of one sort or another. This extends not only to the ordinary design teams for the buildings and the engineering structures, but also to the suppliers of equipment such as baggage handling, lifts and all the other electrical and mechanical equipment necessary for the terminal. Appointments have been on especially derived contracts which are called 'non transactional'. This means that there has been a strong move away from seeing the contributors to the project as buyers and sellers. The whole ethos is that all organisations contributing to the project are in it in order to make the completed project better, to work with other people and to help them achieve their collective objectives. Most of the early planning and design work has been carried out on fully cost reimbursable contracts – contracts under which the client carries all the cost risk.

Beyond transactional contracts

The term 'non transactional' is used to describe the contracts used on Terminal 5 in Box 3. The term comes from Macneil⁷ who defines a continuum in the forms of contract. At one extreme are 'transactional' contracts, used for example for buying goods. At the other extreme are 'relational contracts', for example marriage.

Miles and Ballard⁸ suggest that many contract forms currently in use in construction adhere to the transactional form; they assert that this approach is inappropriate for all but the simplest of projects and go on to say:

"The next era necessary for the construction industry to move forward is one of Self-interest, Project Success Motivated Cooperation. This cooperation must be based upon realistic appreciation and recognition of the self-interests of the participants in a project. The contracts must support these self-interests and provide a framework

⁷ Ian R Macneil (1974), "The Many Futures of Contracts", *Southern California Law Review*, Vol. 47:69, University of Southern California.

⁸ R Miles & G Ballard, "Contracting for Lean Performance: Contracts and the Lean Construction Team". <http://web.bham.ac.uk/d.j.crook/lean/iglc5/miles/miles.htm>.

for the overall best success of the project. This new era will include Relational Contracting.”

Writing about the construction industry environment in the USA, Miles and Ballard describe how Partnering is sometimes used as a ‘patch’⁹ and suggest:

“...the mixing of the transactional contract with the addition of a relational Partnering Charter is inherently ambiguous at best and schizophrenic at worst. What is needed is a cohesive, focused contracting arrangement that is based on the relational end of the contract behavioral axis”.

It is worth noting here the difference between a ‘Partnering Agreement’ and ‘partnering’; the former is the intention and the latter is the action. Unless there is action (‘walking the talk’ in management parlance), then a Partnering Agreement is not worth the paper it is written on.

There are examples of a movement towards relational contracts in construction. One initiative is the ‘Virtual Company — Trust and Money’ model proposed by the Movement for Innovation.¹⁰ In this model, each organisation within the supply chain seconds people to work in a team with the project owner, thus forming a ‘Virtual Company’, in which: *“there is no ‘blame culture’, no discrimination; they each get their predetermined share of the reward, however large or small it may turn out to be; their interests are therefore irrevocably aligned to the Owner’s.”*

The Freeflow Alliance, currently constructing the Grafton Gully project in Auckland, is an example of the way forward for delivery of complex construction projects based on relational contracts. The Alliance¹¹ is the project delivery vehicle that comprises representatives of the Owner, the Designer and the Constructors, similar in concept to the Virtual Company model, without reliance on a standard contract form. It is governed by a Board that has similar representation, and it is the Board, not the Owner, that makes all key decisions relating to the project. All Board decisions must be unanimous and the Owner has limited power beyond directing a change to the project scope and terminating the project in certain circumstances. The principal tenets of the Alliance Agreement are recognition that it is fundamentally a commercial arrangement, shared risk and reward, and a commitment to a culture of no blame and high performance. Sharing risks rather than allocating them to specific parties is fundamental to true partnering and could be used as the test to determine whether a project is entering into the full spirit of partnering.

Under such a framework, the project delivery team can operate in a truly co-operative environment with shared objectives. Their focus is entirely on the delivery process so no energy is expended on contractual positioning and bargaining. All parties gain or lose together; so individual drivers are always aligned with the collective drivers.

⁹ See example in Chapter 9, page 163.

¹⁰ Movement for Innovation, www.m4i.org.uk/wgroups/.

¹¹ As described by David Jewell of Fletcher Construction

Partnering Charters

The partnering philosophy has developed on many occasions on construction projects throughout history¹², and may be considered by the more mature industry players as the normal relationship that should exist on all projects. However, the contract parties may be assisted in developing the partnering philosophy by a formal agreement to be referred to in particular situations.

In a legal context, Bunni¹³ suggested that partnering may constitute no more than an expression of intent between two parties to behave in accordance with a set of agreed principles. Bunni summarised a number of objectives that are aimed at by the parties involved in a construction contract through partnering, which would form the basis of a partnering agreement, as follows:

- **Management and co-ordination.** One of the most important aspects of avoiding conflict on a construction project is the provision of an efficient and effective mechanism for communication and flow of necessary information. This mechanism should extend throughout the project organization from the work-face through to senior management. To facilitate this, partnering structures generally provide for the creation of steering committees or for regular meetings between the parties. Some partnering agreements provide for the whole project to be directed by an integrated board. Often a permanent core of key personnel is dedicated to the project, in order to foster and maintain the partnering approach.
- **Early warning /joint problem-solving.** It is generally accepted that problems and any subsequent conflict that may arise should be resolved as soon as practicable. A partnering agreement would usually include an early warning system designed to act as a net to isolate any problem that is either envisaged or may occur on a construction project. In particular, hazards and risks that may cause loss or damage should be identified, analysed and managed. Risks of economic and/or time loss should also be part of the process of management where the parties could give each other early warning of possible problems that might lead to adverse time, cost, quality or safety consequences.
- **Variations.** Possible conditions that may be particularly relevant for partnering include: an ability for the contractor to initiate variations, whether or not the client has the unfettered discretion to refuse (in some cases, the client may be obliged to agree such variations if it is objectively reasonable to do so). Some forms of contract allow for value engineering clauses or provisions for incentives in respect of contractor-initiated variations that enhance safety or quality or that reduce time or costs. Where variations arise from external circumstances (for example, a change in the law), obligations of co-operation to identify solutions which mitigate time and cost penalties could be extremely helpful and result in the elimination of possible future conflict.

¹² see, for example, the Mangla Project on page 124.

¹³ Nael G Bunni, "Partnering, alliancing and other collaborative, non-confrontational approaches: Examples of an emerging new paradigm" - presented at the CAE *Conference on The Contract in Successful Project Management*, in Christchurch, February 2002.

- **Monitoring of Progress.** If the time for completion of the whole or certain sections of a project is of the essence, partnering agreements are an excellent vehicle to achieve such results.
- **Defects and repair work.** This is another area that may be dealt with in a partnering agreement. The parties may decide on how to co-operate to identify defects, to programme remedial works and to agree working methods, including acceptable alternatives and payments. The cost of repair work is generally taken into account in calculations for incentive purposes.
- **Incentives.** Incentive payments are likely to be linked to cost, time, quality and safety. In some cases the contractors' profit, overhead, and perhaps some element of his cost recovery, will be at risk if targets are not met.

Examples of each of these issues are covered in the Tamar Bridge widening case study, subject of the next paper. Examples of partnering charters by Bunni are reproduced at the end of this chapter.

Sharing risk and reward

Many partnering arrangements use a pain/gain sharing formula. In their simplest form, these can be a simple 50/50 share or some other split, of savings or cost overruns within certain limits. However, more complex arrangements can give added incentives — such as the contractor taking all of the first 5% of savings or overruns; any extra being shared in some proportion with the owner. Owners may choose to invest any savings they obtain back into the project, which can also benefit the contractor in terms of revenue from extra work. Barnes described an example of such an arrangement on the Channel Tunnel Rail Link (see Box 4).

Box 4: The Channel Tunnel Rail Link (Barnes)

This is the new railway, over seventy miles in length and including some very long tunnels, connecting the Channel Tunnel and the south coast of England to central London and to other railways in central London. All the various civil engineering, building, and other types of engineering work are partnering contracts let under the New Engineering Contract. The main option being used is the target cost option. In this the contractors are paid actual costs and there is a pain/gain share arrangement depending upon on whether the actual cost exceeds or is less than the target agreed at the beginning. The client carries the majority of the cost risk.

The arrangement has worked very well on the first section that is the southern half of the route. Most importantly, the financiers are happy with the arrangements and are reported to be backing the construction of the second half with very much more confidence as a result of the effectiveness of the partnering and contracting arrangements on the first half.

Alternative procurement methods

Clients who wish to transfer all the risk for a project to another party may attempt this using traditional forms of contract with additional or modified clauses. The risk of this approach backfiring on the project and the client is discussed by Firth in Chapter 10.

An alternative approach, that is increasingly being used world-wide, is that of assigning total responsibility for delivery of infrastructure or a service to a single entity, which includes the builders and financiers. The structure of such a project, as presented by Bunni¹⁴, is shown in Figure 1, where the project company has full responsibility for delivery. This project company would typically be a consortium of large construction services providers, backed by financiers. Providing the party responsible for delivery is ‘mature’, in the sense discussed earlier, they will understand the importance of, and will be in a position to establish a collaborative culture between, the project stakeholders. An example in the UK is the Autolink company – a consortium of Amey PLC, Sir Robert McAlpine, Ltd, Taylor Woodrow Construction Ltd and Barr Holdings Ltd, established to design, build, finance and operate the new M6 motorway in Scotland.

When such contracts are used by public bodies in the UK, they are referred to as Private Finance Initiative (PFI) projects, which Bunni defined as:

“transactions pursuant to which the national, provincial or local Government engages a private entity to develop, maintain and operate an infrastructure facility in exchange for the right to charge a price,

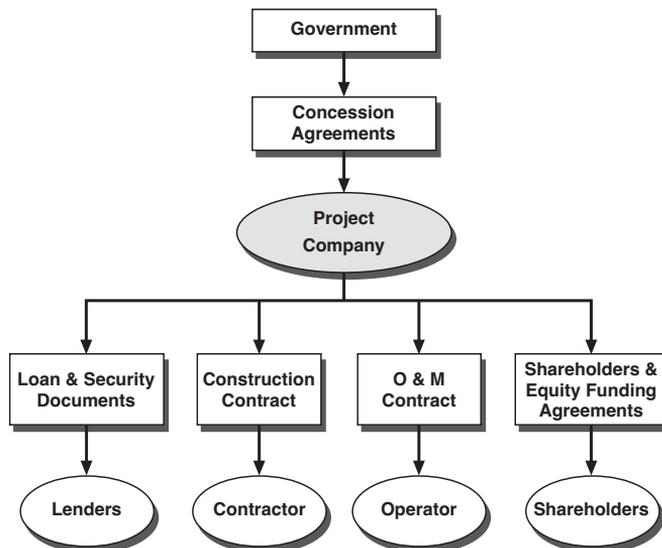


Figure 1: A typical structure of a private finance arrangement (after Bunni)

¹⁴ Nael G Bunni, “Other International Contracting Approaches: The ‘PFI’ or the ‘EPC’ Contracts” – presented at the CAE Conference on the Contract in Successful Project Management, in Christchurch, February 2002.

either to the public or to the Government, for the use of the facility or the services or goods it generates”.

Another term is Public Private Partnership (PPP) defined by Bunni as “A partnership between various public administrations and public bodies on the one hand and legal persons subject to private law on the other for the purpose of designing, planning, constructing, financing and/or operating an infrastructure project”.

The range of contract acronyms in this family is many and varied and Bunni defined the following:

- ‘EPC’ is intended to mean ‘Engineer Procure Construct - Contract’;
- ‘BT’ is intended to mean ‘Build, Transfer’;
- ‘BOT’ is intended to mean ‘Build, Operate, Transfer’;
- ‘BOOT’ is intended to mean ‘Build, Own, Operate, Transfer’;
- ‘BOO’ is intended to mean ‘Build, Own, Operate’;
- ‘BLT’ is intended to mean ‘Build, Lease, Transfer’;
- ‘BRT’ is intended to mean ‘Build, Rent, Transfer’; and
- ‘DBFO’ is intended to mean ‘Design, Build, Finance, Operate’.

Financiers may not understand the importance of the collaborative approach and Bunni went on to say that financiers and banks dislike risk and would prefer to shift the risk to the contractor, a point also made by Tuohey in Chapter 4. Accordingly, a private finance arrangement means greater risk being allocated to the contractor, a greater risk matrix and a greater intensity. The new matrix of risk, according to Bunni, includes: political risks, currency risks, stability of government, unforeseen ground conditions, fitness for purpose in design, technology risk, and many others that are usually either allocated to the employer or have much lower intensity in traditional forms of contract.

However, Bunni noted that such higher allocation of risk means higher rewards to the contractor should the risks not eventuate or, if they do, their effect could be mitigated. On the face of it, this may seem like the situation warned of earlier, where all risks are loaded on to the contractor. However, the difference here is that the contractor has far more freedom to integrate all aspects of the project — design, construction and operation — to balance the risks and optimise the outcome.

It is worth noting at this point that certain regulations may prevent public sector clients from negotiating partnering agreements. However, experience in the UK is showing that public accountability and partnering can go together.¹⁵ One approach

¹⁵ see case study of the Tamar Bridge widening project on page 131 and for other examples see Local Government Task Force www.lgtf.org.uk.

is to use a two-stage tendering process, where it is made clear from the start that the winning tenderer will be invited to enter into a partnering agreement.

Partnering and the International Development Banks

The World Bank and the regional development banks (Asian, Inter-American, African and European) lend to governments and government departments which, in turn, must contract out the acquisition of construction projects, goods, and services using those funds. The guidelines that borrowers must follow require that procurement be carried out competitively, opening up access to contracts to all eligible bidders. An award of contract should be made to the ‘lowest, qualified responsive bidder’. This is a strict rule, which precludes strategic alliancing or long-term partnering in most cases. There are exceptions — particularly when the direct executors of a project are the community that benefits from the new economic asset.

Araujo¹⁶ mentioned a project in Argentina, where the World Bank had financed *“5,000 houses, constructed directly by the communities themselves in a very decentralized and participative approach. This was a great partnership, not with the contractors, but with the final users of the loan.”*

Forms of partnering have been used in past World Bank projects; for example, Mangla Project, in Pakistan¹⁷, completed in the late 1960s, and costing over US\$500 million. At the time, it was the largest project financed by the World Bank, and the largest construction contract let on unit prices. It was a huge challenge for all involved: the Water and Power Development Authority of Pakistan; Binnie & Partners, project consultants, and the contractors, a consortium led by Guy F Atkinson of the USA. Although there was no formal partnering arrangement or charter established, all parties worked in a spirit of collaboration, to resolve the many problems that arose during construction. The project was an unqualified success.

Internally, the World Bank has participated (as the Principal) in a partnering arrangement with the Architect and head Contractor for its own US\$320 million Headquarters Construction Project.¹⁸ Partnering was introduced as a means to resolve severe contractual problems that had plagued the project in its initial phase, from 1989 to 1993. Once a partnering approach was agreed upon, and a charter drafted and signed by all participants down to mid-level managers, communications improved, and an effective system for the expeditious resolution of problems on site was put in place. The improved project administration also required a change of attitude by all participants. The project was completed leaving no claims or issues unresolved.

¹⁶ Armando Araujo, “World Bank - Points of View and Issues”, see Appendix A, page 257.

¹⁷ Details can be found in *Proceedings of the Institution of Civil Engineers*, London: Nos. 38 (November 1967) and 41 (September 1968).

¹⁸ Ernesto Henriod, own experience as Director of the Project from 1994 until completion in 1998.

When the contracting party is a government, issues of transparency and continuity of management policy arise.¹⁹ A senior official faced with a decision to introduce informal partnering, or partnering based on a charter which does not strictly follow the procurement legislation of the country, would feel exposed to being penalized, or loss of his or her reputation after a change of government. Therefore, unless the rules are written into the procurement laws or by-laws, government officers would have difficulty in entering into a partnering agreement.

There is also an issue of trust, in the less developed countries. When contractors come from industrialized or more advanced countries, they can be perceived as exploiters, capable of abusing the trust of less sophisticated local partners or government officials. Partnering arrangements could also be perceived as a disguise for corruption, often the bane of the poorer countries.

Construction Joint Ventures

Whilst true partnering can be difficult to achieve on international projects through formal contractual means, joint ventures are often promoted and when successful provide many of the benefits associated with partnering. In this sense joint ventures could be considered a 'stepping-stone' towards partnering.

The main purpose of joint ventures is the pooling of resources of two or more companies to meet the requirements of a project. Joint ventures provide a mechanism to produce an organisation or team with particular expertise, to respond to the fast-changing market. Many large- to medium-sized construction companies use joint ventures effectively to win construction contracts that they would not have qualified for on their own.

In developing countries joint ventures have particular appeal. For example local construction companies, which may have plenty of labour but lack managerial or technological expertise, will often form joint ventures with companies from more advanced countries, for mutual benefit. The benefits to local companies include technology transfer and exposure to the challenges of larger projects. The overseas companies gain from entry to new markets and access to local labour forces.

Joint ventures will clearly be most successful if the relationships between the parties are based on trust and mutual respect and the share in risk and reward is distributed fairly. When the joint venture companies are of similar size and are familiar with the environment in which they are operating, the challenges they face are similar to those discussed earlier in relation to partnering. However, when companies from different cultural backgrounds come together in international joint ventures the challenges are much greater.

In a paper by Lu and Tan²⁰ experiences of joint ventures in Asia are discussed, highlighting the difficulties of delivering business benefits from situations in which

¹⁹ Araujo, see footnote 16.

²⁰ Lu Youjie and Tan Wee Teck "Construction Joint Ventures in Asia" – see Appendix A, p 279.

control is split between two or more partners.

Promoting Culture Change — a UK Perspective

The UK industry

During the 1970s, 1980s and early 1990s the UK construction industry was typified by adversarial relationships, projects overrunning in terms of time and budget and high dissatisfaction among clients over the quality of products and services they received. Since the industry accounts for 6%-8% of UK GDP, its inefficiency was clearly costing the country dearly. The UK government, as the largest client of the construction industry, decided to be proactive in helping the industry to improve, with two major reviews and a subsequent ongoing initiative to promote innovation in the industry.

The Latham Report

In 1993, the UK Government appointed Sir Michael Latham to undertake a review of procurement issues in the construction industry. The Latham Report *Constructing the Team* was published in July 1994.²¹ The theme running through this report is that the client should be at the core of a collaborative construction process. The report suggested that due to inefficiencies in the industry, a reduction of 30% in the real costs of construction was possible between 1995 and 2000. This target was met and even exceeded by some substantial clients of the construction industry.

Rethinking Construction Report

The Latham Report did not have the widespread impact hoped for, and by 1997 there was still significant under-performance in the industry as a whole. The UK Government set up a Construction Task Force, composed mainly of representatives of large clients of the industry, under the Chairmanship of Sir John Egan. The purpose of the task force was to advise the Government on *'the opportunities to improve the efficiency and quality of delivery of UK construction, to reinforce the impetus for change and to make the industry more responsive to customer needs'*.

Drivers for change

In their report *'Rethinking Construction'*²² (commonly referred to as the 'Egan Report') the Task Force identified five key drivers for change as follows:

- Committed leadership — management belief and commitment to cultural and operational change.
- A focus on the customer — providing precisely what the end customer needs, when they need it and at a price that reflects the value of the product to them.

²¹ Sir Michael Latham, *Constructing the Team*, HMSO, London.

²² *Rethinking Construction – report of the Construction Task Force*, Department of the Environment, Transport and Regions HMSO, London. Report available at: <http://www.rethinkingconstruction.org>.

- Integrate the process and the team around the product — working back from the customer’s needs and the value of the product to the customer.
- A quality driven agenda — zero defects, right first time, delivery on time and budget, innovating and eliminating waste.
- Commitment to people — training and development, respect for all players in the process, sustained learning and improvement and a no-blame culture.

Targets and techniques for improvement

The Egan Report set a number of performance improvement targets related to time, cost, quality and safety in construction projects (see Table 3). Whilst these targets seem extremely ambitious, the report said they are conservative figures, underpinned by the performance improvements achieved by leading clients and construction companies from the UK and USA, and knowledge of the amount of waste in construction. The Egan Report also suggested a number of techniques and new ways of working for improving performance, which along with partnering,

Indicator	Improvement per year	Current performance of leading clients and construction companies
Capital cost All costs excluding land and finance	Reduce by 10%	Leading clients and their supply chains have achieved cost reductions of between 6% and 14% per year in the last five years. Many are now achieving an average of 10% or greater per year.
Construction time Time from client approval to practical completion	Reduce by 10%	Leading UK clients and design and build firms in the USA are currently achieving reductions in construction time for offices, roads, stores and houses of 10%-15% per year.
Predictability Number of projects completed on time and within budget	Increase by 20%	Many leading clients have increased predictability by more than 20% annually in recent years, and now regularly achieve predictability rates of 95% or greater.
Defects Reduction in number of defects on handover	Reduce by 20%	There is much evidence to suggest that the goal of zero defects is achievable across construction within five years. Some UK clients and US construction firms already regularly achieve zero defects on handover.
Accidents Reduction in the number of reportable accidents	Reduce by 20%	Some leading clients and construction companies have recently achieved reductions in reportable accidents of 50% - 60% in two years or less, with consequent substantial reductions in project costs.
Productivity Increase in value added per head	Increase by 10%	UK construction appears to be already achieving productivity gains of 5% a year. Some of the best UK and US projects demonstrate increases equivalent to 10% - 15% a year.
Turnover and profits Turnover and profits of construction firms	Increase by 10%	The best construction firms are increasing turnover and profits by 10% - 20% a year, and are raising their profit margins as a proportion of turnover well above the industry average.

Table 3: Scope for sustained improvement in the UK construction industry (Egan Report - see footnote 22)

included Lean Construction, Value Management and Benchmarking. These techniques are summarized in Box 5.

Process integration

To extend improvements throughout the industry, the Egan Report suggested beginning by defining the integrated project process; this should bring the skills of the whole project team together to deliver value to the client. The process should be explicit, transparent and easily understood by all project players. This is necessary, since efficiency is traditionally constrained by the fragmentation of a project into separate processes. Conventional construction project processes are linear and act as a barrier to use of the combined knowledge of all players in design and planning. Focusing on the end product in terms of the needs of the customer helps to establish common objectives among the whole team, and also

**Box 5: Performance Improvement Techniques
(Egan Report footnote 22)**

Value management is a structured method of eliminating waste from the brief and from the design before binding commitments are made. Value management is now used by up to a quarter of the construction industry to deliver more effective and better quality buildings, for example through taking unnecessary costs out of designs, ensuring clearer understanding of the brief by all project participants and improving team working.

Benchmarking is a management tool that can help construction firms to understand how their performance measures up to their competitors' and drive improvement up to 'world class' standards.

Lean thinking describes the core principles underlying the Toyota Production System and has been shown²³ to apply to every type of business activity.

It recognises that only a fraction, as little as 5%, of the total time and effort in any organisation actually adds value to the end customer. By clearly defining end customer value, all non-value adding waste in the system can be targeted for removal.

The goal is to manage the value stream encompassing all processes across all firms involved in jointly delivering the product or service. The concept is that the product or design flows through all value-adding steps without interruption, pulled by the demand from the end customer. Continuous improvement is achieved by pursuing perfection and systematically removing wasted time and effort.

²³ Womack, Jones and Roos, *The Machine that Changed the World*, Maxwell Macmillan, Oxford, 1990.

leads to more integrated processes. Once the integrated process is in place, the momentum for improved efficiency and quality must be maintained. The focus should remain on improving value for the customer and eliminating waste.

The Egan Report says that time and effort are wasted on site trying to make designs work in practice and recommended that design needs to be properly integrated with construction and performance in use. To achieve this:

- suppliers and sub-contractors need to be fully involved with the design and designers should collaborate in the manufacture and assembly;
- design should cover the whole life of the project;
- clients need to be made aware of the importance of concentrating resources up-front to achieve this efficiency in design; and
- experience from completed projects needs to be fed back.

As a way forward the Egan Report suggested that in order to change, the industry needs first to sort out the culture, then to define and improve processes and finally to apply technology as a tool to support these cultural and process improvements. To sustain the improvements, long-term relationships are needed throughout the supply chain; this will offer co-operation and continuity to enable the team to learn and have a stake in improving the product.

Rethinking construction initiative

In order to promote and extend the culture change throughout the industry, the UK Government set up an initiative named 'Rethinking Construction'²⁴ to work with industry to implement the recommendations given in the Egan Report. The main themes and associated organizations within Rethinking Construction are:

- **Movement for Innovation (M4I)** – facilitating innovation in non-housing construction projects and creating regional cluster groups.
- **Construction Best Practice Programme** – dissemination of best practice and raising awareness of the benefits of adopting rethinking construction practices.
- **Local Government Task Force** – innovation in local government projects.
- **Central Government Task Force** – leads on best practice for government clients.
- **Housing Forum** – facilitating innovation in the house building supply chain.

These organizations work closely with industry to implement innovations in the construction process. Over 400 construction projects in the UK have been showcased as demonstration projects, by virtue of the fact that they are innovating in one or more of the areas detailed in the Egan Report. The Tamar Bridge widening

²⁴ see www.rethinkingconstruction.org

project (see page 131) was an M4I demonstration project. All these projects are subject to a rigorous peer review process, to assess the benefits derived from the innovations. They all measure themselves against a range of key performance indicators (KPIs), based on the targets for success given in Table 2. Analysis of the data from the KPIs shows that demonstration projects are out-performing the industry as a whole and many are meeting or exceeding the targets set.

The Rethinking Construction initiative has reached a point now where it is self-sustaining. Companies involved in demonstration projects have identified this involvement as a competitive advantage, particularly since more and more clients when procuring projects are looking for evidence of partnering ability and may place considerable weight on a company's previous involvement in Rethinking Construction initiatives.

There are some extra incentives for local government projects. All local authorities are now required to demonstrate best value in their procurement of construction services; the Minister of Construction of the United Kingdom has said:

“Rethinking Construction is central to the delivery of Best Value across a wide range of local authority services. The effectiveness of your authority in delivering Best Value for decades to come will depend crucially on how well you manage your construction procurement, how thoroughly you “Rethink Construction” in your authority”.

Government has made a requirement that, by 2004, all local government projects must be compliant with the rethinking construction philosophy. Many local government departments have risen to the challenge and there are many examples of partnering projects underway, for both capital works and for operational and maintenance work. For case studies of such projects, refer to the Movement for Innovation website at www.m4i.org.uk.

Conclusions

A key to the culture change in the industry is summed up in one word: integration. Integration of the project processes and teams can be imposed through contractual arrangements, such as combining design and construction, but the real gains are made when there is a collaborative project culture. Such a culture can and does occur under any form of contract but rather than leave it to chance, collaboration is far more likely to occur if partnering arrangements are established from the start of a project. For partnering to become the norm throughout an industry requires strong leadership, in particular from clients who can influence the culture from the start of a project. If a 'critical mass' is reached of clients and other stakeholders in the industry who recognize the benefits of, and promote collaborative relationships, an industry-wide culture change can become self-sustaining, as is happening in the UK construction industry.

An NEC Partnering Case Study: Tamar Bridge Strengthening and Widening

Tim Wood

Introduction

This paper describes the development of partnering throughout a major construction project. The paper does not say how it should be done but is a frank commentary from which lessons can be learned.

Background

The Tamar Bridge was opened in 1961, providing a fixed link between the major city of Plymouth and South East Cornwall. The bridge replaced a passenger ferry service and is, even today, the only fixed highway crossing of the River Tamar for 20 miles (32 km).

Tamar Bridge is a suspension bridge with a steel truss and concrete towers. It has a main span of 335 m and side spans of 114 m. The road deck is 30 m above the mean high water level and the towers are 65 m high. The bridge was constructed with three traffic lanes, the centre 'tidal' lane carrying traffic in either direction depending on traffic demand. In 1961 the Bridge was carrying 4000 vehicles a day, and the maximum gross vehicle weight (mgvw) was 24 tons.

In 1994 the European Union (EU) issued a directive to rationalise vehicle weights on the roads of all European member states. On 1 January 1999 vehicles of 44 tonne mgvw, and 11.5 tonne axle weight were allowed on European roads. Previous UK limits were 38 tonnes and 10.5 tonnes respectively.

The implication of the EU directive was a major programme of bridge assessments. Assessment of Tamar Bridge in 1994/95 found the anchorages and towers were adequate, but the main truss would need strengthening, the main road deck supported on the truss would need to be replaced and the main suspension

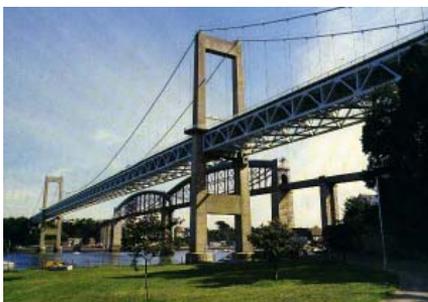


Figure 1: Tamar Bridge, perspective



Figure 2: Tamar Bridge, from tower top

cable was only adequate for 38 tonne vehicles.

In 1996 a feasibility study for the strengthening was carried out. The preferred solution was to add one additional traffic lane either side, providing both strengthening to the truss and additional traffic capacity during replacement of the main road deck, and to add supplementary cables to carry the additional temporary weight of the cantilever lanes and the permanent vehicle loads. Other localised strengthening would be required along with widening at all four corners of the bridge to accommodate the new traffic lanes. During all this work the bridge would have to be kept open to 40,000 vehicles a day!

The Tamar Bridge was built under powers of the Tamar Bridge Act 1957. The Act, which had been promoted as a private Bill by Cornwall County Council and Plymouth City Council, allowed the Joint Authorities to borrow money for the bridge construction and enabled them to charge tolls to repay the loan and to pay for future maintenance. The Tamar Bridge and Torpoint Ferry Joint Committee (TBTFJC) was set up in 1957 to administer the Tamar Bridge and Torpoint Ferries, 2 miles downstream of the Tamar Bridge. The TBTFJC comprises five elected Members from each of the two Authorities. The two Authorities (Cornwall and Plymouth) act as client on TBTFJC contracts and as joint clients on large contracts. For simplicity in this paper the joint clients will be referred to as JC.

Legal opinion was that whilst the 1957 Act allowed the Joint Authorities to maintain and improve the bridge it did not give them the powers to widen the bridge. The Joint Authorities would need to deposit a new Tamar Bridge Bill in Parliament and receive Royal Assent before it could widen the Tamar Bridge. The new Bill was deposited in the House of Commons in November 1996.

The Joint Authorities requested funds from the UK Government for the strengthening project but were refused because they had the ability to fund the works from toll income. TBTFJC had reserves of £18m, a lot, but not sufficient to pay for the works. The politicians on the TBTFJC could not support an increase in the level of tolls and indeed a revised Toll Order would in itself take two years to be approved by the UK Government. It was decided that tolls would be unchanged and the project spend profile would be governed by available funds.

Procurement

Partnering

During the 1980s and early 1990s construction clients were requesting contractors to take over normal client risks and paying enhanced prices for the benefit of a greater certainty of out-turn cost.

To avoid the problems associated with adversarial contracts, used widely in the UK construction industry in the 1980s and early 1990s, the project client, Cornwall County Council, decided the way forward was to identify all the risks and manage them. The JC would accept their share of the risks, provided that both the designer

and contractor were similarly committed to the same project outcomes.

In 1996 the JC had neither the powers nor the funds to enter into the contract to strengthen the Tamar Bridge. To strengthen the Tamar Bridge at the earliest time would mean involving the contractor at the earliest possible stage and to overlap the normal processes of obtaining the powers, design and construction.

It was perceived that the way to achieve this was for the JC to be completely open about their objectives and their key 'drivers'. The JC wanted to enter into contracts with professionals who would be just as open and co-operative, and who would also declare their 'drivers'. This approach was innovative because it required a change of culture from that adopted in the construction industry at the time. Partnering is not, however, a new concept and is nothing more than common sense.

Selecting the designer

In 1996 the consultants who had tendered for the earlier bridge assessment, tendered for the design of the strengthening works. The tender evaluation was based on a 60:40 quality and price model. It was felt that accepting the lowest price would not provide value for money. For example, the JC was seeking a consultant with innovative ideas who would deliver a design that would ultimately save money. Quality issues related to specific ideas for the design, risk management, the consultant's views on partnering, and their willingness to partner.

Hyder Consulting Ltd were selected and appointed to undertake the preliminary design and to provide an estimate of the project construction price. Based on this price a designer incentive scheme was established. Simply, if the out-turn price was lower than the estimate, the consultant would receive a bonus payment; if the out-turn price was higher than the estimate, the consultant would pay back part of his design fee, but be guaranteed a minimum fee.

Early contractor appointment

The traditional procurement route has the design completed before a contractor is appointed but this opens the possibility of the contractor highlighting a cheaper method of achieving the same end result. These alternative tenders are wasteful and ultimately the client pays for two designs, the original and the alternative, in the project costs.

Another option is to tender a design and build contract. Again there is implicit waste and therefore extra cost in this method. On this project Hyder already had a detailed knowledge of the Tamar Bridge, which had been developed over two years, and even if the same consultant were to work for the contractor, the contractor would be taking the risk of the design, but at a price to the client.

To avoid the waste and address design risk openly, it was decided that the contractor would be appointed at the earliest opportunity and work with the consultant to develop the design.

Contractor evaluation was based on the same 60:40 quality:price model that had worked for consultant evaluation. The price element needed to be representative of the works. Tenderers could not price the whole of the works because the design was only at a relatively early stage. It was decided that Hyder would design the steel orthotropic deck, estimated to represent about forty percent of the total construction cost, and the tenderers would price only that part of the works.

The JC and Hyder developed questions to address the quality element of the tender to focus the tenderers on the key aspects of the project. The questions varied between specific ideas for erection sequences, avoiding traffic restriction, to experience of working in a partnering environment. The tenderers were also requested to consider taking on, or sharing, certain normal client risks. There was not a 'right' answer to the apportionment of risk, but the question was directed to solicit a clear stance on risk management from the tenderers. As with the consultant appointment in 1996, lowest price was not the driving factor. The JC and Hyder wanted to identify a contractor who had a similar open and co-operative approach to the project and a willingness to learn together and to participate in activities that contractors would not traditionally be involved with. It was more important for the JC to have confidence in a price, than for that price being the lowest one offered.

Tenders were issued in January 1998 and returned in March 1998. As part of the tender evaluation all five tenderers were interviewed. The winning contractor, Kvaerner Cleveland Bridge Ltd, was appointed in late March 1998.

The contract with Cleveland Bridge was to develop the design with the JC and Hyder and to produce a target price for the whole project, by September 1998. There was no guarantee of the construction contract, because the new Tamar Bridge Bill was still going through the parliamentary process and the estimate had to be within the TBTFJC's budget.

The tender documents had stated that the intended construction contract would be a modified NEC Engineering and Construction Contract, Option C (i.e. target price contract). The detail of the contract would be negotiated once the JC had confirmed that the TBTFJC had the powers and funds necessary to proceed.



Partnering workshops – forming the team

Partnering means many things to many people but for this team it

Figure 3: Project team

meant working together to achieve the project goals. It meant being open and co-operative and thinking about the project need before the individual company need. The team interpretation was not about throwing away contracts, contracts form the main structure and identify risk allocation. The contracts were entered into openly and the ‘win-win’ scenario, often referred to, would happen if each party played their part.

In April 1998 a facilitated workshop was funded by the client and held close to the contractor’s offices in Darlington, UK. The aim of the workshop was to introduce everybody and to give the opportunity for the main objectives and any fears or worries to be aired. The two day workshop was a total success, the Project Team was now complete.

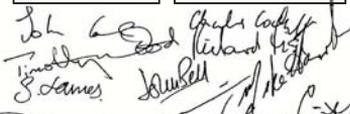
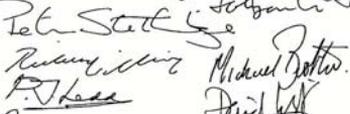
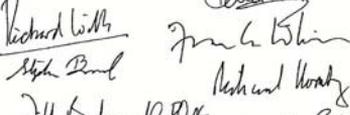
Teamwork in Design

Preliminary design

Having confirmed that the preferred design from the feasibility study was viable, Hyder proceeded to improve the design to minimise the necessary strengthening.

The Tamar Bridge Project Team

We are all committed to:

The Project being completed to specified quality, time and target price	Respecting the needs of others	Always striving for improvements	A happy and fulfilling working environment
A fair return for all parties			The overall partnering aims being more important than the aims of the individual parties
Setting a partnering model for future projects			Working in a spirit of honesty, openness, trust and co-operation
Providing high quality and sufficient resources to unified project team			Minimizing disruption to the public
Achieving high environmental standards	A commercially open book environment	Safety being of paramount concern	

21 April 1998

Figure 4: Project charter

In striving for an economic design they requested numerous departures from standards which were discussed with the JC, so that the reasoning was clear and so that the JC understood the implications of accepting such departures.

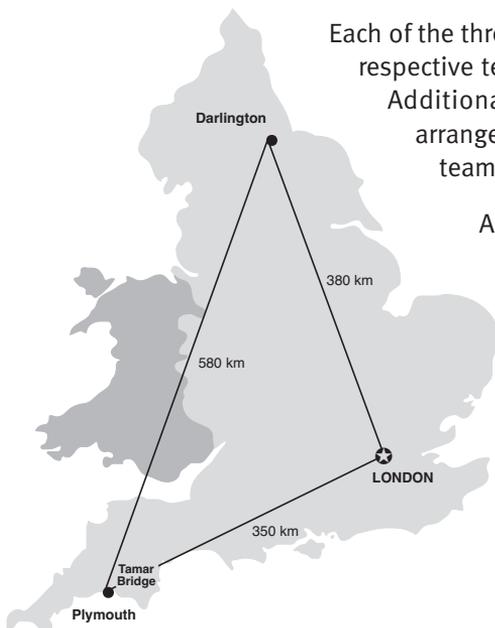
Working together, the JC and Hyder were able to optimise the design. Hyder highlighted particular areas of the design standards that were conservative, carried out a sensitivity analysis and, with the JC, determined the benefits of a relaxation of that standard. Often the JC would invest in additional surveys (e.g traffic flows) or testing (e.g. actual concrete and steel properties) to substantiate and support the departures. The openness of the working relationship made this dialogue possible.

The JC's willingness to invest in the project was a fundamental factor in the success of the project.

Design development stage

Initial discussions with Cleveland Bridge highlighted that they had their own preferred fabrication details for the steel deck design so the one part of the project that had been designed was already going to be changed. Cleveland Bridge's preference would make the fabrication both quicker and cheaper.

To ensure proper project co-ordination and control, the project managers from the JC, Hyder and Cleveland Bridge met weekly. The meetings were mostly held in Hyder's London office for this stage but were sometimes in Darlington or Plymouth. Co-location was considered but the project required the part-time input from many people rather than the constant input of a few. It was decided to work from the parties respective offices.



Each of the three project managers co-ordinated their respective teams to deliver the support necessary. Additional investigations and surveys were arranged jointly to supply information to the team.

A key partnering factor during this stage was the close working of Hyder's designers and the Cleveland Bridge designers and estimators. The designers worked on high value items, high risk areas and on programme critical items. The result of this was to quickly close in on the target project cost. The

Figure 5: Map of England showing London, Darlington and Plymouth

estimators would stop the designers when they had sufficient information to be able to estimate the item value with reasonable (but not absolute) accuracy. This approach was unfamiliar to most and was an early test of working together. Design is an iterative process and sometimes there were more iterations than the contractor had patience for, but this was necessary for the consultant to be confident with his design overall. The team learnt to better appreciate the pressures on each other and certainly developed a greater understanding of the whole project development process. Having such a large influence on the project at this stage, Cleveland Bridge was able to make a real difference and also understand the frustrations of design limitations and of the democratic consultative process.

The JC had key project aims and an additional 'wish list'. Items from the wish list would be included if the target price could accommodate them and stay within the budget.

Integrating design and construction

The JC did not have the safety net of a design completed before the construction started, so rather than the conventional situation, where the consultant has only design liability, Hyder were here also obligated to deliver particular parts of the design to meet a series of dates, to avoid the site works being delayed. Rather than imposing these dates on Hyder they were agreed within the team, recognising the resource needs of all parties. Hyder had been instrumental in developing the procurement process, so were fully aware of this aspect of the project. This was one way the project was able to be fast tracked and was a benefit derived from the partnering culture.

The supply chain

It was decided at the first partnering workshop that only the main parties would be involved in the formal partnering workshops. The thinking behind this was that the partners all needed to know the full scope of the project and the full range of project issues. After the civils contractor (Kvaerner Construction), the next largest contribution would be from the painting contractor, with an equivalent contract value of about £1m, and it was felt that the same level of project commitment and sharing of problems could be achieved by a simpler solution.

There were numerous key suppliers/contractors whose input was invaluable to the project. The key to developing the necessary commitment to the project was to be totally open about the project goals and the restrictions. When seeking contractors we used the team's knowledge and experience to create a shortlist. The suppliers were then asked for their prices for the item of work, but also asked for any other added value they could bring to the project. This approach is not unusual in the industry, but it usually happens in the background. The team's open approach demanded 'all cards on the table'. The team was rewarded by some excellent suppliers/contractors who operated in the same fashion as the main team.

The cable stay supplier (Bridon Structural Systems) offered extensive design experience for the same price offered by their competitor for simple manufacture and supply. This additional design support was to Bridon's advantage, because they could specify a cable that they knew from experience would achieve the necessary breaking load, but with a small margin, and the team could redirect its own designers to other elements of the work.

This avoidance of duplication was a primary objective of the approach, removing waste in the process. The contract with Bridon was extended to include several items relating to the erection of the cables, working with Cleveland Bridge's temporary works designers.

Not only were there financial and time benefits to the project from this closer working relationship but also safety benefits. At times the team was too focused and could miss the obvious. Each new supplier added a new point of view from which the project benefited. For example, stressing of the stay cables was originally designed to be done at the top of the towers, 65 metres above mean high water level, but this was highlighted by the cable suppliers and sensibly the cable system was re-designed to be stressed from the relative safety of road level, making erection, and future maintenance, safer and quicker. This type of saving can not be easily quantified.

Another example of key partnering input was from the Independent Design Checkers, Mouchel Consulting with Leonhardt, Andr and Partner. It would be normal to complete the design then have it checked, but the team could not do this; to match the progress of the design development the check needed to be done in stages. It was also necessary to re-check some areas of the design which changed due to the design iterations. To maintain their independence Mouchel were not part of the Project Team. However, their contribution was significant and provided a mandatory and essential level of scrutiny.

It has been suggested that this second level of consultants is wasteful, but when dealing with public safety the insurance of a second, independent, opinion is essential.

Programme issues

Dealing with delays

Before September 1998, when the target price was to be submitted, it was clear that it would not be possible to start construction until March 1999. Detailed planning permission would be given in January at the earliest and approval to proceed would need to be confirmed by the Councils, which could not be given until 23 March 1999.

The forecast three-month delay to the start of construction was used to maximum benefit. The works contract was to have been negotiated before September 1998,

but it was decided instead to concentrate on the design and get more certainty with the target price. It was agreed that after the target price had been submitted, detailed design would continue straight on. At the same time the JC and Cleveland Bridge would negotiate the contract, and the team would prepare for a construction start in March 1999.

Placing advance contracts

The cable stays were needed early in the construction programme, but the lead time was such that a contract would have to be placed with the suppliers (Bridon) before it was known whether the scheme could go ahead. Cleveland Bridge was, quite reasonably, not able to take this risk, so the JC took the risk and guaranteed recovery of the cable supply cost if the project did not proceed. Cleveland Bridge placed the contract with Bridon to secure the delivery dates and avoid programme delays. This demonstrates how the JC's willingness to invest in the project was essential to its success.

NEC contract

At tender in January 1998, the JC had stated that the contract would be based on the NEC Engineering and Construction Contract, Option C (target price with activity schedule). Certain secondary options had been decided upon, like the need for retention. Importantly, issues like setting liquidated damages and advanced payments were left for future negotiation. It was clear that modifications would be needed to the standard contract, for example the design would be delivered gradually, not all at construction start.

The focus of managing risks, building in value and avoiding waste were as important here as in the design process. At tender, Cleveland Bridge had offered to adopt or share certain risks with the JC. These were built into the contract.

The NEC contract was chosen because it best reflected the spirit in which the client wanted the contract to run, i.e. *"The Employer, the Contractor, the Project Manager and the Supervisor shall act as stated in this contract and in a spirit of mutual trust and co-operation"* (Clause 10).

Other reasons for choosing the NEC were as follows:

- Programme — rather than keep reflecting on an original programme the NEC requires the programme to be updated monthly by the Contractor. This gives a much better appreciation of progress and programme and the possible implications of changes.
- Incentive scheme — Option C includes an incentive scheme. The client wanted the contractor to share in any savings or overspend to develop the common goals and commitment in the project.
- Problem solving and compensation — NEC focuses on resolving the problems.

The procedure of Early Warning Meetings (EWM) serves to bring all parties together to solve the inevitable problems that arise and to move on. The process of EWMs followed by compensation event notifications and, if appropriate, compensation event quotations, is clear and aids effective project management.

There were approximately 180 compensation event notifications during the Tamar Bridge project. This number was not considered to be any more or less than could have been expected had the contract been administered under any other form of contract.

Risk sharing

The client's risks are clearly defined by the compensation events and, by inference, the contractor's risks are those that are not the client's. The openness of monitoring costs and applying a *contractor's fee* is refreshing and ensures that the Project Manager has a better understanding of the construction costs.

Facility to amend or add clauses

The JC did not want to make too many modifications to the contract. The main changes that were made are as follows:

- Introduction of an additional three-stage issue resolution procedure. This had to be used before any issue could be referred to adjudication.
- Introduction of a 'Suicides' compensation event. Measured similar to weather, it reflected the disruption caused by attempted suicides from the structure and made the Contractor aware of the risk.
- Amendment to the payments clause. The JC had reserves of about £20m (in 1998), so to avoid paying the Contractor in arrears and the project incurring financing costs, it was decided to make an advance payment. The advance payment primed the construction start, but there were other periods through the contract where cash flow was forecast to be difficult. It was agreed that the JC would, at each assessment, pay the last month's costs (as usual in Option C) plus the forecast personnel cost and cost of invoices that would become due for payment before the next assessment date. This agreement allowed the construction contract to run almost 'cash neutral' avoiding unnecessary financing costs.

The lawyers, brought in to help at this stage, were encouraged by the openness of the partnership and were pleasantly surprised to be involved at the drafting stage rather than at the adjudication stage!

Contract Signing

Final approval to proceed was given by Cornwall County Council and Plymouth City Council on 23 March 1999. The contracts were signed and the construction contract started the same day.

Construction Stage

Integrated team

The Project Team had developed excellent working relationships over the previous twelve months (March 1998 to March 1999). Working together to solve problems was normal operation. The way to build on this was to share all site facilities; there was one Project office, a combined commercial team, one computer network and the administration staff supported the team.

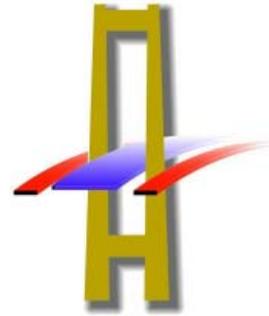


Figure 6: Team logo

Public relations

It was important that the Tamar Bridge Project Team had an image and a single point of contact for the public and the media. A logo was created which everybody could identify with and a full time press/customer relations officer was appointed (as a resource of, and a cost to, the Project).

The team wanted to promote the project, to make the public and bridge users aware of what was being done, to aid understanding and to mitigate any frustrations about traffic delays or disruption to their normal way of life. The team issued a quarterly newsletter, held bi-monthly residents meetings and gave presentations to local interest groups and professional institution meetings. A visitor centre was set up in the project office where groups from schools, societies, and clubs were given talks. Staff from all parties shared the workload. The team always maintained that no matter whom you ask in the team, the response would be the same, whatever the subject. This was certainly true for the public relations issues, but obviously we would draw on each party's specialist experience for technical presentations.

Enlarging the team

As mentioned above, the NEC family of contracts embodied what the Project Team was about, that is a fundamental obligation on all parties to operate with a *spirit of mutual trust and co-operation*. The challenge was how to impart the partnering culture to the enlarged team required for construction.



Figure 7: Project office

Many projects have succeeded regardless of the contract form adopted; one of the common factors for success is good people relationships.

The first and most important way of engendering the partnering culture through the larger team at Tamar was to

lead by example. The project managers from the lead parties worked closely and as one. The skilled workforce took pride in their work and, like anybody, wanted to do the job only once. The team emphasised the need for clerk of works/ inspectors and charge-hands to work with the workforce, maintaining a dialogue, and avoiding defects rather than waiting to list them. This was stating the obvious for most people, but an essential part of the success formula. It was believed to be important that everybody involved on the project knew that their input was valued and important to the outcome of the project.

A financial incentive scheme was introduced, offering a bonus of 10%, up to £500, of whatever saving was realised from a suggestion. The scheme was another way of getting people to think about delivering the project cheaper and faster.

Impact of staff changes on the project team

There were a number of staff changes during the construction stage due to changes in the individual organisations: Cleveland Bridge underwent a management buy out in late 1999; In mid 2000 staff were promoted within the JC; and in early 2001 Hyder Consulting was acquired by a management buy-out.

The effect of these changes individually was not significant, but progressively the team began to lose its partnering ethos. The trust and co-operation that had been developed between the project managers and Directors was being lost by the gradual replacement of key team members. However, the close working relationships that had been developed on site were strong and made a huge contribution to keeping the team together and reinforcing “*the needs of the Project being more important than the needs of the individual parties*” (one of the original edicts of the partnering charter).

In February 2001, a third partnering workshop was convened to refocus all the team’s efforts to the common goal of completing the Tamar Bridge Project as quickly as possible. Relationships did not instantaneously improve, but an action plan was agreed to recover the programme and resolve outstanding issues. With all issues aired the trust and openness re-emerged over the coming months.



The Outcome

Contractual completion was achieved on 20 December 2001, six weeks late after thirty one months. The project out-turn cost was only 10% higher than the original budget.

Figure 8: Construction progress, cantilever progress from tower top

Strengthening and widening an existing suspension bridge is a complex operation and one which could have been subject to large cost and time over-runs. The team approach worked at Tamar Bridge.

The strength of the Tamar partnering was not that everybody was happy all of the time, but that strong professional and personal relationships had been established which allowed difficult topics to be discussed and resolved. The trusting, open approach has stood the team in good stead throughout the project, albeit tested to its extremes at times.



Figure 9: The completed project

Examples of Partnering Agreements

Nael G Bunni

In its simplest form, a partnering agreement can consist of a one-page statement of core values and mutual goals.

A Project Charter

[Name of Project]

The Parties involved: [Owner/Employer]
..... [Contractors]
..... [Engineer/ Architect]

do hereby commit to the following core values:

- Effective management, resourcing and communication
- Respect for the environment and the public
- Mutual trust, respect and integrity
- Effective listening and discussion

and our Mutual Goals are:

- Achievement of budgets, thereby delivering reasonable returns
- Timely resolution of issues at all levels
- A high standard of quality and safety
- Job satisfaction for the whole team
- On time completion

Accordingly, we are committed to the following mission statement:

We will work together with openness and integrity, committed to effective teamwork and co-operation to make this a successful project.

Signed on behalf of [the Owner/Employer]:

Signed on behalf of [the Contractors]:

Signed on behalf of [the Engineer/ Architect]:

Place:.....

Date:

A more complex project may require a more detailed agreement, with special forms that will assist the partnering activity.

A Project Charter

[Name of Project]

Table of Contents

1	Project Partnering Charter
2	List of Participants
3	Identification of the Objectives
4	Issue Resolution Ladder
5	Resolving Problems and Developing Action Plans
6	Partnering Follow Up
	6.1 Partnering Leaders
	6.2 Partnering Performance Evaluation
7	Results of the Partnering Workshop Evaluation

1: Project Partnering Charter

[Name of Project]

The Parties involved: [Owner/Employer]
..... [Contractors]
..... [Engineer/ Architect]
Date:

We do hereby commit to work together

1.1 We commit to work together in a professional and collegial manner to provide that is recognised for its distinct quality, prestige and functionality.

We further commit to deliver this facility in a cost-effective and timely manner while achieving the highest standards of workmanship and ensuring that each individual contribution will be proud to have been associated with this project.

Consequently, we will assist each other with all the knowledge and skills at our disposal to provide and maintain an open forum for the prompt identification, discussion and timely resolution of any problem which may arise on our Project.

1.2 We shall do this with enthusiasm through cooperation, ingenuity, and integrity.

Mutual Trust, respect, dedication, open-mindedness and honesty shall be the medium in which all members of the Project team will be working.

Signed on behalf of:

- 1
- 2
- 3
- 4
- 5

2: List of Participants

Name	Title	Phone No.	Fax No.	e-mail
Owner/Employer				
1				
2				
3				
Contractors				
1				
2				
3				
Sub-contractor No 1				
1				
2				
3				
Sub-contractor No 2				
1				
2				
Supplier No 1				
1				
Supplier No 2				
1				
Consultants No 1				
1				
2				
Consultants No 2				
1				
2				
Senior Employees				
1				
2				

3: Identification of the Objectives

Owner/Employer and Consultants	
No.	Within the context of the applicable law codes, culture and public policy, and also in accordance with the provisions of the contract:
1	Scope:
2	Schedule:
3	Cost:
4	Quality:
5	Future Relationships:
Contractors & Sub-contractors	
1	1.1.1.1.1
2	1.1.1.1.2 Satisfaction of the Client
3	1.1.1.1.3 Time
4	1.1.1.1.4 Quality
5	1.1.1.1.5 Fair Compensation
6	1.1.1.1.6 Satisfaction of the parties
7	1.1.1.1.7 Avoiding conflict
8	1.1.1.1.8 Exposure and implementation to the Canadian methods
9	1.1.1.1.9 Prestige to be involved in this work
	1.1.1.1.10 Potential economic spin-off from participation in the project

4: Issue Resolution Ladder

	Reaction Time	Client/ Owner	Consultants	Main Contractor	Ditto	Sub-contractors	Others
1.2.1.1.11 1.2.1.1.11	1 hour						
1.2.1.1.12 1.2.1.1.12	24 hours						
1.2.1.1.13 1.2.1.1.13	24 hours						

5: Resolving Problems and Developing Action Plans

Problem	Action Plan		
Category: Administration	What to do	By whom?	When?
1 Permits	Obtain required permits	As required	As required under the Contract
2 Procrastination/delay	Weekly meetings; <ul style="list-style-type: none"> • Identify problems • Establish responsibilities • Establish target dates 	All personnel	Periodic updates
3 Ensure that all parties are fairly compensated for costs relating to resources and time	<ul style="list-style-type: none"> • Develop clear implementation schedule to enable all to plan their resource allocations and compensation requirements accordingly. • Initiate action according to contractual provisions to resolve overhead costs that have not, to date, been compensated for. 	All personnel	By date as agreed
Category: Communication	What to do	By whom?	When?
4 Communication problem: Language. Is there a language problem on site?	Resolve as appropriate	As required.	2.2.1.1.13.1.1 Daily
5 Provide appropriate periods for the process of approval and review). This period can be doubled if there is a rejection either by the consultant or by the client	To identify very early items that have a potential to be rejected (equivalents) and to apply for acceptance for the equipment before the presentation of the shop drawings.	By sub-contractors	Before the presentation of shop drawings
6 Communication problem: Distance and Time.	Written message asking for an appointment for verbal communication.	By all parties involved	Minimum of one day
7 People are not talking to each other	All parties involved in a certain problem should meet, talk openly and reach a decision before the meeting is over.	Parties involved in a problem	Immediately after the problem is identified

Category: 1.2.1.1.13.1.1.1 Design	What to do	By whom?	When?	
8.	<ul style="list-style-type: none"> Define scope of work On site problems/site conditions Shop drawings and submittals 	<ul style="list-style-type: none"> Define scope of work of different subcontractors mainly electrical and mechanical sub-contractors Site conditions to be brought up for attention Programme for shop drawings to be discussed 	<ul style="list-style-type: none"> Client Contractors All concerned 	<ul style="list-style-type: none"> Prior to preparation of shop drawings In a timely manner To comply with requirement schedule
Category: Health & Safety	What to do	By whom?	When?	
9. Identify hazards and Risks	2.2.1.1.13.1.1.2 All to discuss	All concerned	At commencement and periodically	
Category: Environment	What to do	By whom?	When?	
10. Work area restrictions	<ul style="list-style-type: none"> Deliveries to the site? Storage of materials? 			
11. Traffic permit	Contacts with the traffic dept, to ensure obtaining a permit & constant follow up for its renewal	By subcontractor	2.2.1.1.13.1.2 When needed	
12. Neighbour's complaints	Major works that generate too much noise might need to be specifically planned.	By Main Contractors		
Category: Quality	What to do	By whom?	When?	
13. Very high standards: <ul style="list-style-type: none"> Quality How will it be monitored & maintained 	<ul style="list-style-type: none"> Proper verification Supervision of execution 	2.2.1.1.13.1.3 Contractors and Consultants	Full time supervision of work in progress	
14. Time Crashing vs Quality of work	<ul style="list-style-type: none"> Quality will not be sacrificed for time Appropriate resources are required Proper supervision & testing 	2.2.1.1.13.1.4 All parties All parties	As required according to schedule	
15. Perceived non-compliance with quality assurance and quality control procedures	<ul style="list-style-type: none"> Submittal of quality control plan Review of quality control plan Proper testing methods Proper reporting methods 	2.2.1.1.13.1.5 All concerned	2 weeks before starting work and periodically	

Examples of Partnering Agreements

Category: Programme	What to do	By whom?	When?
16. Approval of shop drawings and various contractors' submittals	<ul style="list-style-type: none"> • Drawing submittal to be in an orderly fashion • Review of shop drawings 	All concerned	2.2.1.1.13.1.6 As per schedule, either in contract or to be agreed
Category: Resources	What to do	By whom?	When?
17. Specific problems to be discussed	<ul style="list-style-type: none"> • ??? 	Contractor and sub-contractor	2.2.1.1.13.1.7 Immediately

6: Follow-up Plan

6.1 Team Leaders:

Indicate names and communication numbers

6.2 Partnering Performance Evaluation:

- 1 Communication
- 2 Team spirit
- 3 Respect for deadlines
- 4 Availability of Resources
- 5 Availability of Information
- 6 Clarity, coherence and precision of documents
- 7 Quality of work
- 8 Meetings' efficiency and effectiveness
- 9 Participants' actions with respect to requests for changes

Name:

Date:

7: Results of the Partnering Evaluation

8: Recommendations as a result of the Partnering Evaluation

9

Preventing and Resolving Disputes: the Role of the Neutral

Gay Pavelka, Ernesto Henriod & Frank McDonough

Abstract

The two papers presented in this Chapter deal with the crucial role of the Neutral in modern contract drafting and project management. In the first paper, Gay Pavelka gives us a brief, but thought-provoking examination of the spiral of conflict, and the salutary role that a Facilitator can play in defusing the animosity that frequently surrounds the development of a dispute, and its escalation to impasses that have to be resolved by adjudication or court ruling. Whether specified in the contract or not, the facilitator can be appointed at any time during the execution of a project to improve inter-personal relationships in a contract, leading to the resolution of a particular dispute, or to longer-term measures for enhancing the effectiveness of project management, such as the introduction of *partnering* (as was the case in the World Bank headquarters construction project – see the case presentation at the end of the Pavelka Paper.)

In the second paper, Ernesto Henriod and Frank McDonough discuss neutrals as part of the contract, either as an ad-hoc resource for the *resolution* of a problem that is becoming, or has developed into a dispute (e.g. the ‘expert’ in Section 13 of NSZ3910, discussed in Chapter 7), or as a person or panel whose participation in the project from its outset is provided for in the contract: for instance, the Dispute Resolution Boards of the USA, or the Dispute Adjudication Boards in the FIDIC conditions of contract. When appointed to follow the evolution of the project from the beginning, the neutral’s principal role is that of a dispute *prevention* resource.

Facilitated Discussions – Preventing the Conflict Spiral

Gay Pavelka

Introduction: The Conflict Spiral

Problems are always emerging in any activity involving inter-personal relationships. Many are resolved as they emerge, but some problems escalate into a conflict that often seems well beyond the seriousness of the issues. This spiral of conflict is well illustrated in Figure 1, by Carpenter and Kennedy.¹

Avoiding this kind of tiring, relationship-damaging, and destructive conflict is an obvious goal for all involved in the management of contracts. A process that will assist in achieving this objective must be strong enough to overcome the fact that not many of us like problems, and people tend to avoid admitting they have arisen. The resulting pattern is usually one of avoidance, no attempt at resolution, and escalation. Facilitated discussions can prevent disputes developing. Mediation, once a dispute has developed, can assist in building an agreement on how future conflict will be managed before it escalates to a stage that requires the intervention of an arbitrator or the courts of justice.

A facilitator, as does a mediator, provides a neutral, skilled approach that supports parties to negotiate their own agreements. The contract may be the focus of discussions but facilitated discussions can be applied to a wide variety of project issues.

Enter the Neutral: Facilitated Discussions

Facilitated discussions are managed in a range of ways to suit the uniqueness of each case. However, there are fairly well defined steps which the parties can anticipate in facilitated discussions. They include:

- Selecting and engaging the facilitator;
- Information gathering from all parties;
- Confirmation of the issues to be understood and resolved;
- Educating each other about points of view, separating out facts and assumptions to establish an agreed set of information;
- Agreeing on criteria to assess options;
- Identifying a range of options;
- Evaluating options;

¹ Susan L Carpenter and W J D Kennedy, *Managing Public Disputes*, 1988 (page 12)

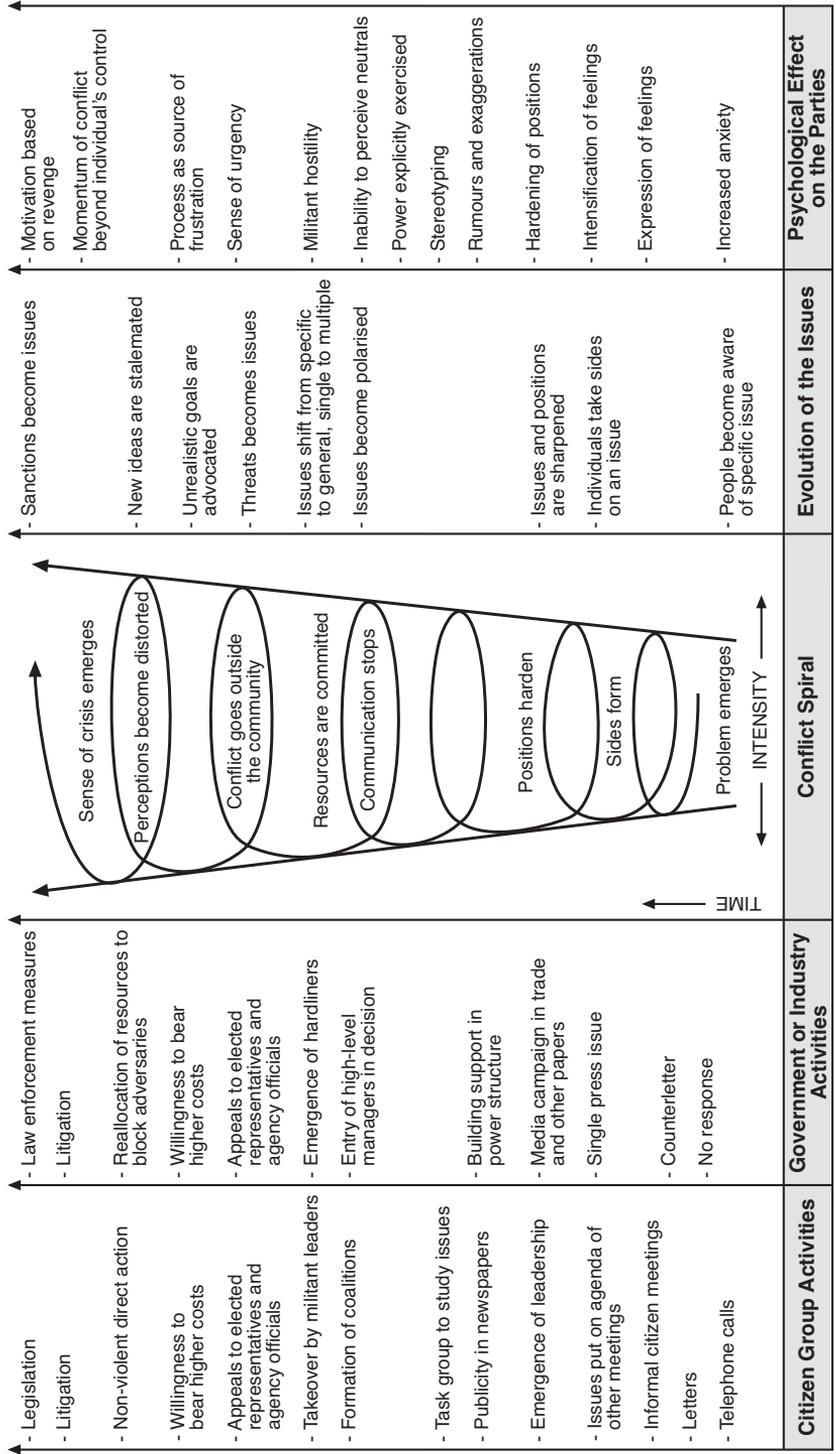


Figure 1: Spiral of unmanaged conflict

- Decision-making; and
- Reviewing the agreement and implementation progress.

A necessary pre-requisite is that the parties agree to engage a facilitator, and participate in the process which is outlined above, in a spirit of goodwill. A ‘*facilitation*’ process is not imposed on the parties — they must agree to become involved and contribute to its outcome. Needless to say, the degree of response the facilitator can elicit from the parties will depend on his or her experience, and the respect and trust in which the person is held by the parties. Thus, the success of this approach depends, to a large extent, on two factors: first, the willingness of the parties, and second, the selection of an appropriate facilitator.

The Strengths of Facilitated Discussions

Facilitated discussions include the following strengths, which are listed without regard to any order of priority:

- By being responsible for the content and outcome of the discussions, the parties learn that they have the ability to manage their differences, and need not be dependent on others for solutions.
- A chance to ventilate frustration and other emotions in a private meeting, moderated by the facilitator, means that strong feelings can be aired without further damaging relationships among the parties.
- The parties can define what they need to discuss. The topics often extend beyond legal issues related to a contract.
- The tone and manner of talking, the ways of asking questions and expressing alternative views of the ‘situation’ offered by the facilitator can help the parties see their situation differently.
- The parties are free to concentrate on the substantive issues and on achieving a working relationship, while the facilitator steers the process.
- Negative language, which is often present as the problems develop, and frequently becomes a block to progress, is re-framed in the process into constructive, problem-solving language by the facilitator. ‘Re-framed’ language promotes a joint ownership of the issues by presenting constructive statements of what needs to be understood or resolved. A mutual gain approach is promoted.
- By understanding the parties’ needs and goals, a facilitator can ensure the discussion focuses on satisfying the parties’ interests, and avoids competitive arguing for favoured solutions or positions.
- The risk of settling on the first solution suggested and failing to seek other creative solutions can be overcome by facilitated problem-solving that aims to create a choice of solutions. Premature decision-making is also prevented so

that the consequences of adopting the various options are fully understood before reaching commitment.

- ‘Fresh eyes’ can see a situation differently. Specialist knowledge of a topic and familiarity with information or a situation predisposes us to see and sense aspects particular to our area of knowledge. For example, a city person walking in the bush may notice the density and size of the trees; a hunter may notice signs of deer disturbing the forest floor, and a botanist may concentrate on the flowering plants present. A facilitator working outside of the framework of the parties’ prior experience can observe more creatively, and can help all the parties build a complete picture of the situation.
- The risk that sometimes comes with an unpredictable imposed solution through litigation can be replaced by facilitating a mutually satisfying practical solution. The parties keep control of the outcome, knowing adjudication remains a backstop.
- When new information is needed, the parties can jointly agree on:
 - who will provide the information,
 - what methodology will be used,
 - any interpretation issues to be identified, and
 - when the information will be required.

The data thus gathered is commonly owned, rather than the alternative of having expert information that becomes a ‘bullet in the gun’ for each party to use against the other.

- Some agreements can be trialed and reviewed to encourage commitment and to check that the most workable answers are found.

The Limitations of Facilitated Discussions

Facilitated discussions do have these limitations:

- There is a financial cost, and time commitment, without the guarantee of an agreement. This is particularly a problem if there is very limited time available to resolve an issue, and the consequences on not reaching an agreement are serious.
- The willingness of the parties to listen to each other, and the motivation to actively participate in the joint discussions is essential.

In summary, facilitated discussions provide the flexibility to satisfy a wide range of situations through a low-risk process. The approach recognises the importance of protecting working relationships so that people are able to deal with each

other with confidence in the future. It is a well-trying tool for preventing the spiral of conflict.

An example of the work of facilitators: The World Bank new Headquarters Building²

The World Bank headquarters offices are located in central Washington D.C., one city block away from the White House complex. Since the formation of the Bank after the Second World War, the premises had been growing within the same block, first, by gradual acquisition of existing buildings that were later joined with bridges and tunnels, and later by developing new buildings as land was bought within the same block (the 'Main Complex') and adjacent streets (for further outlying buildings).

In the late 1980s, the Main Complex consisted of four pre-war buildings, and two newer ones. These buildings had severe functional shortcomings including, particularly, the almost impossibility of installing the communications lines necessary for modern networking. Physical communications were also difficult, and staff spent much time in the twisting corridors of a group of buildings that had developed without a master plan. Offices were dark and poorly laid out, and there was plentiful asbestos in ceilings, pipe lagging and other parts of the structures requiring heat or fire protection. The Bank's Board decided to redevelop the whole area of the Main Complex.

After an international architectural competition, the winning design was developed, and a contract signed in 1989 with a local construction company to build or refurbish the 2.2 million square feet Main Complex. The contract consisted of the gradual demolition of the four older buildings, staged construction of the new building, and gradual gutting and refurbishment of the remaining two post-war buildings. Work on excavation and construction of the first stage new building would start with only conceptual architectural drawings, no detailed services drawings, and only the detailed structural designs. The structure of the new buildings would consist of reinforced concrete columns and post-stressed beams and floor slabs.

In other words, this was to be a *fast-track* project, starting with basic essentials, and only conceptual ideas of what would follow. Several problems arose from the decision to go ahead in this fashion: first, in the absence of final designs of a very complex set of buildings, the total cost of the project and the time needed for construction were grossly underestimated; second, the architectural details had to be fitted into structures constructed before those designs were finished; and new penetrations worked out for a large part of the building services. The final design of the services (water, sewerage, drainage, power, heating, ventilation and air conditioning, and communications) required penetrations in places not

² Note by Ernesto Henriod, who was responsible for the project from 1994 to 1998, as Director of the Headquarters Construction Department.

foreseen initially, with the added complication that the floor slabs had been built in post-stressed concrete.

By 1993, it was clear that the cost, originally estimated under US\$200 million, would exceed US\$300 million. Over 5,000 “change orders” (variations) had accumulated and were unresolved, as the parties were unable to negotiate reasonably and constructively. The head contractors were preparing a claim, valued at about US\$12.5 million.

After an investigation, the Bank’s Board decided on a change of project management. A Headquarters Construction Department (HQC) was established to replace the previous ad-hoc administration, with its Director reporting to the Bank’s President. As one of the first steps of the new HQC, the project estimate was recalculated more realistically at US\$327 million, a figure which the Board approved, albeit reluctantly. HQC also appointed firms specialising in construction law, and project scheduling and management, to provide assistance.

The heads of the three main contracting parties (client, architect and head contractor) met, and agreed to appoint new managers, fresh to the project and free from the previously escalating animosities. A further key development was the agreement by all parties to bring in a *facilitator* to help improve channels of communication and help resolve the problems and areas of impasse. Several sessions were held with the facilitator assisting the parties in their discussions to identify the ‘stones on the road’, and agree on means for better communications and working relationships. Perhaps the most important outcome of the facilitated discussions was the decision to establish a *partnering agreement*, with a structured plan for the discussion and resolution of problems (a ‘reverse cascade’, starting at site level and escalating gradually to senior management if the problem was not resolved) and a Charter to guide all concerned with the project towards successful completion.

The first positive outcome of the new arrangements was the resolution of the US\$12.5 million claim for a fraction of that amount, and the negotiation and settlement of the over 5,000 variations. The performance of all concerned improved considerably, and so did personal relationships, resolving problems — often very complex — as they were identified on site. The whole project was completed in 1998, with a final cost of US\$320 million, and leaving no disputes unresolved. The same facilitator had paid sporadic visits to the project, meeting all parties in friendly sessions, and assisting in maintaining the momentum of the positive environment he had helped create.

As a footnote, the introduction of *partnering* after a project has gone sour has been a frequent practice in the USA, and has been described by Miles and Ballard³ as a “programmatically Band-Aid”. This approach to partnering is therefore a *cure* for

³ Robert Miles and Glenn Ballard, *Contracting for Lean performance: Contracts and the Lean Construction Team*, 1997.

a sick patient, rather than a tool for *prevention* of contract sickness, when partnering or a DRB/DAB are introduced at the beginning of contract execution (see also Chapter 8 and the following paper by Hernriod and McDonough).

The Neutral as Part of the Contract

Ernesto Henriod and Frank McDonough

Introduction

In previous chapters we have reviewed the change that has been taking place in the management of construction contracts, away from adversarial confrontation, and towards a collaborative approach; we have also discussed the new forms of contract that are emerging, in the world and in New Zealand. The changing culture, the advent of partnering, and the introduction of neutrals and adjudication in the newer forms of contract, are all part of the drive towards achieving greater efficiency in the construction industry, reducing the expenditure and waste created by the culture of claim, confrontation and litigation.

One of the most successful approaches at removing the spectre of unresolved disputes in contracts has been the introduction of the Disputes Review Boards¹, pioneered on the West Coast of the USA, and now enshrined in the World Bank Standard Bidding Documents (SBDs), the Asian Development Bank Sample Bidding Documents, and the FIDIC Conditions of Contract (the last two show them under a slightly different name, Dispute Adjudication Boards). The NEC includes a neutral — the Adjudicator — available to resolve disputes as they arise. An important feature of the Boards and the Adjudicator is that they are preferably appointed in the Contract, and should be available *from the start of contract execution*.

By contrast, NZS3910, in its present form, includes the good offices of an *expert*, appointed only after the dispute has arisen, to provide “*a recommendation to assist in resolving the matter*”. On a par with any neutral contribution based on a non-binding recommendation, the real worth of this approach hinges entirely upon the respect commanded by the expert among the parties, and the extent to which the parties will accept his or her professional judgement. If challenged, the recommendation is ineffectual, as the parties may then proceed, in two further steps, to mediation and arbitration. All these steps are assisted by neutrals brought in *after* the problem has occurred and threatens to escalate, or has spiralled into a dispute. By definition, these neutrals come to the project after it has started, and have to be brought up to date with the details of project development and the background of each dispute. Their contribution to the project is therefore limited to the resolution of one or more specific disputes, with little effect on *prevention*, a more desirable and less costly approach.

A further discussion of the provisions for dispute resolution in NZS3910 is given in Chapter 7. This paper will refer mostly to the neutrals appointed in the contract, who follow its development and assist as problems arise — DRBs and DABs: in short, *functional contract neutrals*.

¹ The name is expected to change to 'Dispute Resolution Boards'. This change is currently subject to confirmation by the membership of the DRB Foundation, and it would better fulfil the DRBF bylaws, which describe a DRB as a “*means for prevention and resolution of construction disputes*.”

The Disputes Review Boards (DRBs)

One of the first recorded attempts at forming a DRB was a successful *advisory board* of four members which helped bring the dispute-troubled Boundary Dam project in Washington State, USA to a successful and litigation-free conclusion, in the mid-1960s.² This was followed by a report on *Better Contracting for Underground Construction* commissioned by the US National Committee on Tunnelling Technology, which was highly critical of the frequency of claims, disputes and litigation affecting construction projects, and raised awareness as to the need to develop a better approach to *dispute prevention*.

The formal concept of *Disputes Review Boards* did not arise until the early 1970s; the first major contract employing a DRB was the second bore of the Eisenhower Tunnel, in Colorado. Following a dispute-plagued first stage, the second bore proceeded smoothly with the assistance of a DRB. The basic concept of the DRB, as a board of three highly experienced members who would keep track of project construction, and provide non-binding recommendations for the resolution of problems, was established at that time. The procedures for the operation of the DRB were yet to be formalised industry-wide, and were developed by the Eisenhower Tunnel panel as the project was constructed.

In 1980, a World Bank-financed project in Honduras, the El Cajon Dam (Latin America's highest concrete arch dam), was the first project outside the USA to use DRBs. Since then, use of DRBs has extended rapidly: by 2001, 818 projects worldwide, with a total contract value of US\$41.0 billion had used DRBs. The projects ranged from an Art Museum and a City Hall, to hydro-electric and highways projects. In the 818 building and civil construction contracts supported by DRBs, 1021 disputes had been settled, and only 31 of the disputes had been taken beyond the DRB process.³ Close to one half of those thirty-one disputes referred to *one* problem project, in which the DRB did not operate as required by the generally accepted principles of absolute impartiality.

It is important to note that DRBs main role is that of dispute prevention — first, by their regular presence at the site of works and their availability to defuse problems as they arise, given the experience of the DRB members and their current knowledge of site development. And second, the personal experience and prestige of the DRB members, and the method of their selection, make it difficult for the parties to challenge the recommendations they issue: they thus become a deterrent to escalating a problem into a dispute to be subjected to arbitration or litigation.

The gains in overall efficiency and savings brought about by having a DRB in the contract are highlighted by their relatively very low cost — *vis-à-vis* the costs of unresolved disputes, arbitration and litigation. According to Chapman⁴, “*The costs*

² R M Matyas, A A Mathews, R J Smith and P E Sperry, *Construction Dispute Review Board Manual*, McGraw Hill, 1996.

³ Dispute Review Board Foundation, *Forum*, Volume 6, Issue 1, January 2002.

⁴ Peter H J Chapman: “Worldwide Application of the DRB Method of Dispute Resolution”. Paper presented at a World Bank Seminar on *Ten Years of DRB Success at China's Ertan Dam*, Washington DC, 2001.

of setting up and running a dispute board have been estimated between 0.05% and 0.3% of the project cost — the proportion being less the higher the value of the project.” In contrast, Chapman states that: “Arbitration can take months or years. 50% of legal cost in construction is dispute related, and 10% of projects spend 10% of project cost in legal fees.” In such extreme cases, legal fees could amount to 5% of the overall cost of the project — a totally unproductive expenditure, usually due to the lack of an effective means for dispute prevention.

In this discussion, the term Dispute Review Board (DRB) is used as a generic term, encompassing all forms of functional contract neutrals, whose selection and *modus operandi* follow the same patterns.

Formation of a DRB

In the larger projects, DRBs usually consist of three highly-qualified, experienced and respected professionals who have a solid background on the type of project being developed. The World Bank SBDs include a variant — that of the Disputes Review Expert, one person only, for smaller projects. This option is also open in the ADB SBDs and the FIDIC Conditions (the former by reference to the latter’s Form).

The FIDIC Guidance section sums up the importance of the selection process: “The adjudication procedure depends for its success on, among other things, the Parties’ confidence in the agreed individual(s) who will serve in the DAB. Therefore, it is essential that candidates for this position are not imposed by either Party on the other party”.⁵ Should the parties fail to agree on the appointments (or to the later appointment of a replacement member), these are referred to a wholly impartial entity. The FIDIC document suggests FIDIC itself as an option; the World Bank SBDs list a number of international authorities that could be approached for the purpose.

The World Bank SBDs (in its Annex A) and FIDIC (Clause 20) list a number of requirements that must be met by DRB members, relating to their impartiality. They include, *inter alia*, requirements referred to their financial interests, employment record, professional or personal relationships, and fluency in the language of the contract. After they are appointed, they must not be employed by either of the parties, or engage in caucus or reach agreement with the parties or the Engineer individually.

DRB members must maintain their impartiality throughout the period of their activities, and disclose any circumstance that may impair their continuing independence and impartiality, at which time they would resign and be replaced.

The documents also detail the conditions of engagement, such as payments (monthly retainer, travel time, daily fees for site visits), office and travel expenses,

⁵ *Conditions of Contract for Construction — For Building and Civil Engineering Works Designed by the Employer*, International Federation of Consulting Engineers (FIDIC), 1999. Guide to Clause 20.

air fares (at “*less than first class*” in the WB SBDs), and taxes (which, in World Bank projects, would be reimbursable). DRB members must remain available for hearings, site visits and other Board meetings, on seven days’ notice. The World Bank SBDs specify daily fees as established from time to time for Arbitrators under the International Centre for Settlement of Investment Disputes (ICSID) Administrative and Financial Regulations.

Usually each of the Parties covers one half of the DRB members’ fees and expenses.

Operation of a DRB

The above standard documents also detail the manner in which the DRB conducts its activities, starting from the time its members sign a Declaration of Acceptance of their terms of engagement, which is attached as an Annex to the WB SBD. FIDIC includes ‘Procedural Rules’, also as an Annex. To sum up:

- the Parties to the Contract must provide all contract documents required by the Board, including a regular supply of progress reports, variations orders and other documents relevant to the execution of the Contract.
- the Parties must also coordinate the site visits by Board members.
- DRB members visit the site at regular intervals (usually three times each year), and at times of critical construction events and at the written request of either party.
- site visits are usually conducted in an informal manner, in the presence of the Parties and the Engineer. On completion, the DRB prepares a report.
- should either of the parties object to a decision or lack of decision by the Engineer, the matter is first raised in writing with the other Party. The other Party presents its own views on the case and, if they fail to agree on a solution, the matter is referred to the DRB, with a “*request for recommendation*”.
- after the DRB members determine that there is a case for the Board’s intervention, a date and place for a hearing is established by the DRB. The hearing can be carried out on site or at the place most convenient and cost effective for the purpose.
- the hearings are conducted in the presence of representatives of the parties and the Engineer, all of whom are given full opportunity to express their opinions on the matters under dispute. DRB members do not express any views during the hearings, but meet privately to formulate their recommendations, which should be based on “*the pertinent Contract provisions, applicable laws and regulations, and the facts and circumstances involved in the dispute.*”⁶
- The Board is urged to make every effort to reach a unanimous Recommendation.

⁶ The World Bank: Standard Bidding Documents — Procurement of Works. Washington, DC, January 1995.

The standard conditions of contract specify timings for the various steps involved in forming the DRB, and in determining its participation in the resolution of a dispute. They differ from contract form to contract form, and should be carefully taken into account by Parties and members of a Board alike.

After the Board's recommendation is received, the parties must decide whether to accept it, or proceed to the next step — dispute resolution by arbitration or a court of law, as the case may be. FIDIC proposes an intermediate step: that of Amicable Settlement (Clause 20.6). As mentioned previously, there is an impressive record of disputes having been resolved by DRBs.

The Construction Dispute Review Board Manual (see Footnote 2) offers detailed advice on each of the steps outlined above, and should be required reading for any professional appointed to a DRB. It is based on the experience of the membership of the DRB Foundation, collected and edited by four of its prominent members, all of whom have had extensive participation in DRBs.

Two Cases of the Application of a Dispute Review Board: The Ertan and Xiaolangdi Hydropower Projects, China

In a letter dated 22 August 2001 to Frank McDonough, organiser of a World Bank seminar on Dispute Review Boards⁷, Gordon Jaynes states *“I am happy to report that I now have obtained the necessary permission from the Xiaolangdi Multipurpose Dam Project to report the successful completion of construction, with no claims outstanding.”* This is an extremely complex project costing a total of 35 billion yuan, including US\$1.2 billion dollars in foreign funds. It will provide ice and flood protection, sediment reduction, irrigation, water supply and hydro power (1,800MW).

Jaynes' letter describes the contractors' arrangements: *“three Chinese/Foreign joint ventures were involved in the main civil works, and were comprised of 10 Continental European constructors together with 4 Chinese constructors. Each joint venture contractor was supervised by a Chinese engineering company, and the Employer was advised by a Canadian joint venture consulting firm.”* The DRB was formed by three international experts of renown; Mr Jaynes chaired.

He concludes, *“With admirable collaboration of all of the Project participants ... the Project was completed in the summer of 2001, ahead of schedule, and all the disputes were resolved amicably by the Project completion date.”*

Previously, Ertan Dam had been completed successfully. This is the largest power plant in operation in China, with an installed capacity of 3,300 MW. The estimated final value of the civil works exceeded US\$2.0 billion. Both Ertan and Xiaolangdi were financed in part by the World Bank.

⁷ The cases are drawn from a collection of papers presented at a World Bank seminar on DRBs, on 19 September 2001. This addendum quotes, in particular, from the above letter from Gordon Jaynes, and from a Paper by J Bradshaw: “The DRB Process—A View from the Trenches”.

The Ertan Dam contracts were let under the previous version of FIDIC (4th Edition, 1987, as amended. FIDIC had not yet included DARS in the standard text). Two joint ventures, consisting of Italian and German contractors respectively, each associated with Chinese companies, were awarded the main contracts. Bradshaw comments:

“the bold move ... of introducing a DRB in Ertan clearly had the objective of assisting the diverse parties administer the FIDIC contracts — which is a form of contract that requires a lot of administering.”

The final accounts were closed satisfactorily in the year 2000.

Bradshaw adds:

“the DRB process derives much of its ‘zing’ (sic) from the fact that the Board members are a mixture of engineers and legal people; that they have relevant experience and visit the project regularly, and so become familiar with it and the personalities involved BEFORE troubles start.”

He also commends the generally informal character of the site visits and hearings, at which all parties participate, and the issue of non-binding recommendations:

“...were DRB recommendations to be ‘final and binding’ it is regrettably easy to predict that the whole atmosphere would change and the whole process would rapidly become bogged down in the same (heavy proceedings) that pervade arbitration...”

An important recommendation is that senior management should read any position papers before they are submitted to the DRB and the Board convenes a hearing. In this way, Bradshaw expects that many problems would be resolved before they would become disputes to be reviewed by the DRB. This raises another important issue in any negotiation and, in particular, in the DRB hearings. Since DRBs are expected to resolve problems before they escalate to full-blown disputes, it is important that those who read the submissions and set corporate strategy and policy on the matter under discussion, as well as those who participate in the hearings, are empowered to reach decisions.

“DRB hearings are not arbitrations or legal proceedings — and the hearing time is short. It is necessary to get the facts on the table quickly.” Bradshaw suggests that:

“[the] hearing process could be more efficient if the DRB were to issue to both parties before the hearing a list of its questions, based on the position papers received.”

Whilst the ability to take this step may depend on the time available, given the particular circumstances of the project and the urgency for the resolution of a problem, nevertheless it could save time and effort by all parties concentrating

on the specific issues concerning the DRB.

“Every human endeavour is subject to gamesmanship, and the DRB hearing process is no exception.” Last minute delays, denying the Board a site visit, and other ruses have been used in the past; parties can also be *“economical with the truth”*. Such delays and tactics *“can become difficult for the most pragmatic of chairmen.”* The strength of the Chairman’s personality, and the respect he or she commands in the industry and among the Parties is, undoubtedly, a major consideration in the choice of DRB members and their leader. *“The Ertan chairman imposed some rather strict time tabling on the Parties, so obliging them to be brief and to the point.”* They were wise *“draconian restrictions. Forced brevity wonderfully concentrates the mind.”*

These brief extracts from documents circulated in the World Bank seminar (footnote 7) highlight a number of important points regarding the operation of the DRBs. Jaynes’ letter signals an important requirement for the work of any neutral to be successful: the need for a spirit of collaboration among the parties to a contract. Bradshaw also points out important features of DRBs and makes suggestions from the point of view of a participant who was responsible for collecting and presenting the points of view of the joint ventures: a soldier in the trenches, as he described himself.

In the previous chapters we have reviewed the law, the history of contracts, the new trends in contract drafting, and the opportunities offered by a change in the culture of the contracting industry and the emergence of collaborative approaches and the ‘contract neutral’. All bode well for the future ... and it is to be hoped that the call for better contracts and better contract relationships will be heeded. Nevertheless, we must keep an eye open for the human failings that can create major difficulties and even the failure of contract — either through leaving a sequel of disputes or causing the total breakdown of the project.

This chapter presents two accounts of the sources of failure: they are both drawn from long experience, and expressed in frank and informal terms: first, Derek Firth gives his views from a legal standpoint, quoting from his own experience in New Zealand and Asia as a contract writer and arbitrator, to bring awareness to some major problem areas in contract drafting and management. His paper is presented with a minimum of abbreviation or editing: it has been written with the strength and passion that the failings he describes elicit in a concerned professional.

Ernesto Henriod, a civil engineer, also brings forth his long experience as a consultant and contractor in international and New Zealand practice, and many years as principal procurement advisor and senior manager in the World Bank, to present a listing of the human failings he has observed, failings that can bring a project into disarray. He also gives practical examples of some human errors of omission or commission, and their effect on projects.

This is a preamble to the penultimate chapter, in which eminent lawyers and engineers — all of whom have considerable experience in the resolution of disputes through arbitration and litigation — give their views on the steps that follow the setting of an impasse among the parties to the contract, and the consequences of escalating disputes beyond the ambit of the contract, and the parties and their immediate support.

Contract Disputes — Reasons and Resolutions

Derek S Firth

Introduction

Having been involved almost continuously on the legal side of construction projects since the mid 1960s, it is impossible not to develop a number of biases and pet hobby horses. However, I would like to think that the hobby horses which have lingered will withstand objective scrutiny because they are the result of 35 years of advising employers or contractors on a large range of civil engineering and building projects in well over a dozen countries. Over the years these have included a power station and its subsequent extension in Indonesia, offshore drilling programmes in the Pacific and South China Sea, as well as many more traditional construction projects. For many of those projects (including 12 hotels in New Zealand in the last five years) I have been responsible for or involved in the preparation of the original tender documentation. In that 35 year period there must be well over 100 projects (some of them quite large) for which I had responsibility for the conditions of contract.

I hesitate to say, although it is absolutely correct, that in not one of those projects has any dispute ever proceeded to arbitration. Obviously, there has been a significant level of good luck in this, but it is certainly a satisfying benchmark.

I now turn to the topics which I wish to address, in a somewhat informal presentation. It is not appropriate to deal with these topics in 'textbook' fashion, because these comments stem more from a feeling for what does and does not work in practice.

Lack of Understanding of Basic Construction Law Concepts — resulting in deficiencies in project documentation

Sadly, many advisors have simply not understood some basic construction precepts. Equally sadly, this lack of understanding has often manifested itself in legal advisors to banks and other funding agencies. A few simple examples follow.

During the 1960s and 1970s a body of law developed in England, the gist of which was to the effect that if there was a provision for liquidated damages in a contract, then an extension of time clause would be narrowly construed so that it did not extend to the employer's fault unless it expressly said so. The reasoning was quite simple. If any employer could rely on its own fault to extend time, and therefore preserve the right to liquidated damages, it would be taking advantage of its own wrong.

Many people used to make jokes about the New Zealand Ministry of Works, but as long ago as 1983 it issued a revision of PW64 (its then standard terms and

conditions) which expressly included in the extension of time clause the right to extend time for any breach of contract by the Employer. For some 15 years I subsequently said in numerous conference papers and annual lectures at a post-graduation series run by the University of Auckland School of Engineering, that it was essential to follow the lead of the Ministry of Works; that they had got it right and that any extension of time clause which did not expressly apply where the employer was at fault, would be negligently drawn.

I might as well have saved my breath because apart from a handful of construction lawyers and the bigger consultancy practices, the point was ignored. The result was an endless number of disputes where liquidated damages could not be recovered and time was legally set at large. Even today, there are many lawyers (particularly advisors to banks) who, I think, do not yet understand this very basic principle.

A second example is the ability (or lack of it) on the part of an employer, engineer, architect or project manager to hurry a contractor along. This difficulty stems from other elderly cases in which it was held that, in the absence of an express provision to the contrary, a contractor had an absolutely free hand as to how it managed its work. It could do nothing for the first 90% of the time and magically finish within the last 10% of time, if able to do so. As a result, standard forms of contract came to include an obligation to progress diligently with the works. Other terminology was used, but generally speaking most attempts to require the contractor to keep moving expeditiously were clumsily handled and difficult to enforce in practice. As a result, programme compliance obligations have become the norm, but these are only as good as the skill of those who draft them.

The problem becomes exacerbated when concurrent causes of delay arise, some being the fault of the contractor and some being the fault of the employer. In an important Canadian case, generally followed elsewhere, it was held in 1966 that where such concurrent delay occurs and it is not possible to accurately apportion responsibility for the delay, then the contractor is to get the benefit of the doubt and should receive an extension of time for the full amount of the combined delay. This led to standard forms being refined again but nothing seems to have emerged which satisfactorily deals with this problem.

An experienced 'claims-minded' contractor, when confronted with a delay for which it is responsible, will procrastinate with catching up in the hope that a subsequent delay will be brought about by the employer. This could, for example, be as a result of the late supply of drawings or materials or the like. The contractor will know that as soon as a concurrent delay occurs that is the fault of the employer, it will not be too difficult to fudge the consequences of its own earlier default.

To deal with this common difficulty some of us devised, back in the 1970s and early 1980s, a contractual regime with two specific requirements. The first was to give the employer an option to require a contractor to accelerate (at the employer's expense) where the contractor was entitled to an extension of time. The second

was to require the contractor to catch up delays for which it was responsible within a given period such as a month or other reasonable time acceptable to the engineer.

A graphic example illustrating the importance of retaining the right to manage delays is the dewatering of the foundations of a plant or a tower building project. A week of lost time (near the beginning) might be caught up by doubling the number of pumps at a cost of say \$10,000. If that week's delay is not caught up at that time but has to be caught up in the final week of the project then the additional cost could be a quarter of a million dollars or more for exactly the same length of delay.

Thirdly, the variations clause is often misunderstood. If circumstances arise within the ambit of the variations clause, then the contractor is entitled to a variation. Furthermore, the law is quite clear that even if a situation is not directly covered by the variations clause but the circumstances demand a variation (for example, arising from a deficiency in design, or a fault or breach on the part of the principal), then the law will often deem those circumstances to constitute a variation and an arbitrator can retrospectively grant a variation order from a certain date. These circumstances are becoming known as 'deemed variations'.¹ In similar circumstances, where a variation order has been wrongly refused, the courts have found a remedy through the principles relating to unjust enrichment.

With this in mind, it is therefore utterly nonsensical to see provisions in contracts requiring the consent of a financier to any variation, or any variation above a certain threshold. In fact, what is so dangerous about such a provision is that if a variation should be ordered (either because it is within the ambit of the variation clause or it is a deemed variation) and it is refused, then the contractor will have a number of remedies at its disposal, not the least of which is an entitlement to damages; and the range of remedies may well extend to time being set at large and all rights to liquidated damages being lost.

A fourth example is the method of valuation for progress payments. Under virtually every standard form of contract the contractor is entitled to progress payments based on a valuation of the works or percentage completed.² However, it is not uncommon for financing agreements (which are between the lender and the owner or developer) to limit progress payments to ensure that there will always be held back sufficient monies to complete the works.

On most jobs, a traditional valuation approach and a cost to complete approach will coincide, or not differ greatly. However, on some projects a significant gap

¹ See the line of reasoning adopted in *Brodie v Corporation of Cardiff* [1919] AC 337, *Holland and Hannen and Cubitts (Northern Limited) v Welsh Health Technical Services Organisation* (1983) 18 BLR 80, *State Rail Authority (NSW) v Baulderstone Hornibrook Pty Limited* (1988) 5 Building and Construction Law 117, and at 123 for a list of further authorities.

² As a matter of passing interest, the New Zealand Construction Contracts Bill which is expected to be enacted later this year will provide a statutory entitlement to periodic payments based on "the value of the construction work carried out...".

can develop and widen. If a contractor is clearly entitled to be paid on a value of work done or a percentage complete basis, but monies are being held back because the quantity surveyor advising the funder is reacting to a cost to complete approach, then the employer is simply acting in breach of contract and the contractor can stop work or sue for damages. Of the many contracts that I have seen for recent developments in Auckland, I have on only one occasion seen a provision in a contract which expressly states that while progress payments will normally be made on a value of work completed basis, the funds will be drawn down on a cost to complete basis and if there is a difference the contractor will have to live with it. That's fine, (although it might not be after the Construction Contract Act is passed — see footnote 2) since the contractor was warned and tendered on that basis. But it is absolutely dishonest to administer a contract on a cost to complete basis without being entitled to do so under the contract.

One common feature of the above recommendations is that they are not unfair to the employer or to the contractor. Further, the contractor is not, in the above examples, required to react to the whim of an unscrupulous employer or project manager and go uncompensated in draconian circumstances.

Lack of Adequate Design (where there is a traditional form of contract)

For a long period of time it was standard practice to complete a detailed design before tenders were called. The scope of work was clearly defined and the pricing was likely to be fairly accurate. Considerable care was taken to get the design right because it was known that any changes would constitute a variation. Everyone knew where they stood — whether the design remained unaltered or not.

However, in more recent times, it has become quite common for work to be put out for tender when the design is far from complete and yet where the contractor is somehow supposed to live with the risk of what will turn up in the future in the designer's mind. Those who try to draft smart clauses to 'stick' the contractor with that risk [for example, through 'lump sum' or 'Guaranteed Maximum Price (GMP)' techniques] are, in my opinion, behaving irresponsibly.

[Since preparing the rest of this paper I have come across the very important decision in *Multiplex Constructions Pty Limited v Epworth Hospital*, Court of Appeal of the Supreme Court of Victoria, 28 June 1996 (apparently not reported.) This is a majority decision of Phillips and Charles JJ.A with Brooking JA dissenting. All three judges say that the case is unusual based on uncommon special provisions and it is probably for this reason that the case has not been reported.

However, the case does reflect circumstances which, in principle, are all too common in the construction industry. Multiplex tendered a lump sum price of AUD52.975 million to do extensive work for Epworth Hospital. This included the demolition of some buildings, the refurbishment of others, and the addition of new buildings including a large block for an additional 350 beds.

The variation clause started off in standard form but it concluded with an additional provision purporting to exclude from being a variation "any change/s or additional

work/s caused by or resulting from the development of the design of the Works (including, without limitation, the development of the design for that part of the Works not documented or not fully documented as at the date of the Builders Tender and/or in the Design Development Drawings or the Design Development Specification(s)).”

There were other specific provisions making it clear that the Design Development remained incomplete and was to be fully documented; also; that “...*the Contract Sum includes all allowances to fully compensate the Builder for all risks and contingencies (whether ascertained or not ascertained) and costs and expenses and any varied, changed or additional works caused by or howsoever resulting from the Design Development of the Works...*”

The builder made a claim for over one thousand variations that it said were not caught by the exclusion relating to design development. The sum claimed was approximately AUD 3.4 million.

Twenty sample items (selected by agreement) were referred to the Special Referee. Four were withdrawn; of the remaining sixteen, eight were held to be variations, five were held to be covered by the exclusion clause and therefore not variations, and three were held to be variations in part.

The Special Referee decided that, in respect of aspects of works fully exposed in the tender documents, only ‘refinements’ would be permitted at the expense of the builder. However, for those aspects in which “*the design development process was incomplete or possibly not commenced at tender*” additions or increases in the works might be, but not necessarily were, to be at the builder’s cost; each item was to be assessed on its individual merits. (It was accepted that all changes would have been variations if the exclusionary provision had not been present.)

The report was then the subject of argument before Byrne J who disagreed with the approach adopted by the Official Referee. Byrne J held that changes to the design did not fall outside the meaning of ‘design development’ provided the function of a component part of the works was not altered. He considered that only part of one alleged variation was truly a variation and the matter was referred back to the Referee who issued a second report adopting the approach of Byrne J.

On appeal to the Court of Appeal of Victoria, Brooking JA preferred the reasoning of Byrne J. However the majority preferred, generally, the reasoning of the first report of the Special Referee: the majority decision summarised the position, “...*the redesign of what has already been designed will fall outside the exclusionary proviso...*” (And therefore, being something different from design development, was to be treated as a variation).

In my respectful opinion, the decision of the majority is, unquestionably, correct. Somewhat ironically, the dissenting decision of Brooking JA commenced by saying, “The letting of construction contracts where design is the responsibility of the owner’s architect or engineer and at a time when the design is far from complete is a common practice and one which gives rise to many disputes.” He then quotes from Dunham & Young’s *Contracts, Specifications and Law for Engineers*, (fourth edition by J T Bockrath, pp249-50) where the dangers of rushed and inadequate preparation of tender design documents is emphasised.]

There is nothing wrong with seeking a price for work where the design is not complete; but the contract documents must not only reflect that position, but have within them a fair mechanism for dealing with it. In fact, it is not too difficult to do so. It simply comes down to a careful definition of the scope of work intended to be covered by the original price.

Inadequate Definition of the Scope of the Required End Results (for a design-build contract)

Equivalent problems arise with design build contracts because many do not focus on the most obvious requirement — defining the end results. A simple example can be given with regard to the mechanical services. In a standard traditional form of contract, the specification would define the size and extent of the ducting, the exact type of the heating and cooling equipment, the capacity of the fans and all the other detail which would go to make up the system. In other words, the contractor could safely assume that if it didn't work it would be the designer's fault.

A design build specification for air conditioning need not address any of the matters just referred to. It should define end results: design life, future maintenance parameters, temperature range, air change frequency, and so on. Only then can the design-build contractor be at fault if the system doesn't work.

Amazingly, a number of employers call for design-build prices yet the specifications follow the traditional form of stating the method to be followed for construction. This recipe for certain trouble could not be more elementary to foresee and avoid, yet it is hard to comprehend how even this basic concept is often not understood.

With design-build contracts there will be a few — very few — aspects of work where the method needs to be defined. The finishes provide a classic example. But there will be little else unless the employer is clearly intending to retain some design responsibility.

Lack of Understanding of the GMP Concept

Of all the fashionable trends in construction projects, this takes the cake. Where did the guaranteed maximum price (GMP) concept originate? Not with anything we ever see in traditional buildings. Not with residential apartments, not with commercial premises, not with industrial premises, not with hotels, or anything similar.

The whole concept was developed in the field of civil engineering with complex projects where very sophisticated international contractors had better in-house expertise and design capability than most private consultants. It was in this setting that such contractors were willing to be bound to a GMP concept. This was because they had the skill to design the petrochemical plant, or design the sub-sea pipeline, or design whatever it was. If they were not the principal designer, they had some design input, and always had the skill to reasonably foresee the ultimate scope of work.

Many consultants and lawyers thought they would do their clients a favour by introducing the same concept into every kind of construction project. However, because of the relative straightforwardness of many projects, most tenderers do not have any sophisticated in-house design capability. They simply cannot properly

assess the final scope.

Developers and other employers have been wrongly/badly advised to call for tenders on a GMP basis (unless the project is one of those rare ones where it is appropriate). Many, sometimes all, of the tenderers have no capability whatsoever of knowing what the maximum price might be or how to calculate it. The design is always incomplete at the time of tender (otherwise there is no need to even consider the GMP concept) so the whole process is usually a nonsense. If the contractor fails to complete or goes under, the employer and the consultants have only themselves to blame.

The main problem with GMP contracts is that the scope of work (including the end results) is not properly defined. How can any contractor price any job (traditional, design build, GMP or anything else) if the scope of their work is up in the air and left to the whim of future decisions by others.

A good definition of end results is an essential feature of a GMP contract as it is for a design build contract. How an employer or its consultants, believe they can bring a traditional approach to bear (where the employer has full responsibility for design) and then thrust a guaranteed maximum price on to a contractor where the design is not fully developed and the contractor has no design skills, is simply beyond belief. It is commercial naiveté at its worst.

Funding Terms which can Strain or Jeopardize the Certification Process

One has the impression that financiers and their advisors feel that the position of a lender is best protected if the contractor is placed in a financial straightjacket regardless of what the final scope of work might be. Such an approach overlooks the basic principles discussed earlier in this paper. Such an approach displays ignorance of construction law. Such an approach will never, ever succeed.

Hopefully, everyone understands that a construction project depends upon adequate funding; but 'adequacy' depends on allowing not only for the information available to be priced, but also for the cost of changes in scope and the other inevitable problems that arise which increase cost. If the total available funding is perceived at the outset to be a bare minimum, then it will never be enough.

Another harmful approach is where the funding terms limit each draw down to a cost-to-complete basis, when that is not the contractual basis for payments to the contractor. This has already been discussed.

The involvement of the financiers in variation decisions can be a recipe for disaster, as discussed earlier, unless it is in a rational setting. Obviously, the involvement of financiers is justified if the variations relate to truly optional changes. But a blanket requirement for financier's approval to all variations simply displays a complete lack of understanding of the construction process and of construction law. In fact, it displays such a high level of ignorance that no true construction

lawyer worth his or her salt would want to be associated with it.

An Australian tendency has shown signs of catching on here on occasion. That is the concept of the financier being a party to the construction contract. To be quite honest, I have not yet got my head round the ramifications of this. It seems to me that it is an approach which must be fraught with danger unless carefully implemented.³

A lack of Understanding by Certifiers as to their true Functions and Obligations.

It is very important to remember the number of people who rely on proper certification — the contractor, the financier, the employer, the owner (who may be different from ‘the employer’ in a contract), lessees, purchasers, insurers and probably others from time to time.

Interim Payment Certificates are of vital importance to the owner or developer as they are the official measure of the value of work to date. Those certificates are of vital importance to the contractor because they establish cash flow.

The Certificate of Practical Completion is important for other reasons. Up until that point, the employer is entitled to require full compliance with the contract (except for normal maintenance or remedial works). However, once the Certificate of Practical Completion is issued, the employer is deemed to have accepted anything that is obviously not in compliance with the contract. If the employer does not like the non-complying work then the simple solution is to insist that the certifiers do not accept it. An example might be the type (as opposed to the quality) of any finishing, the colour of the roof (unless it is immediately flagged as a maintenance item), and other things that might be different from what has been specified, but which are plainly in evidence.

Too many certifiers try to have it both ways by certifying prematurely and then endeavouring to ‘stick’ the contractor with something which should have been identified earlier as being unacceptable. Sometimes developers will acquiesce in the premature issue of a certificate of practical completion so that they can uplift deposits from ultimate purchasers and enforce settlements.

In a nutshell, the certification process is often abused and this leads to many difficulties which can easily be avoided.

Warning from a recent case: In March 2001 the Singapore Court of Appeal handed down its decision in *Hiap Hong & Company Pte Limited v Hong Huat Development*

³ In this connection, it is interesting to note the World Bank rules (which apply in other international financing institutions): the Bank does not participate in the management of contracts in any way, and its loan officers are banned from passing judgment on the evaluation of bids (other than ensuring that the Bank’s Procurement Guidelines were complied with) or participating in project management. This is based on simple principles: first, the sovereignty of its borrowing member countries over development work in their own territory; and second, the exposure of the lending agency to acquiring the responsibility for contract failure, when associated with judgments passed by the Bank or its Officers. See also Appendices, Note on A Araujo’s statements. (Editor’s Note)

Co (Pte) Limited [2001] 2 SLR 458. In short, the architect employed by the employer failed to issue progress payment certificates in a timely manner. In a judgment that seems to totally ignore well-established principles adopted in most countries, the Court of Appeal held that there was no implied term imposing a contractual obligation on the employer to ensure the proper discharge by the architect of the certifying functions. Accordingly, where it was established that the architect was late in issuing interim certificates entitling the contractor to progress payments, the contractor had no claim to interest or other compensation against the building owner for loss of use of the monies that were received late.

I am aware that some standard forms of contract specifically address this issue, as well as late payment of a certificate (see, for example, clause 51.4 of the New Engineering Contract⁴), but that is probably the situation in a minority of standard forms.

In the above case there was ample authority to justify the opposite decision. Examples are to be found in the cases cited earlier in relation to deemed variations. In addition, there is the very good decision of Judge Vinelott in London Borough of Merton v Leach (1985) 32 BLR 51, at 81:

“In Holland Hannen and Cubitts v Welsh Health Technical Services Organisation ... it was conceded that under the contract there in issue ‘...the building owner would do all the things necessary to enable the contractor to carry out the work’ and His Honor Judge Newey clearly thought that that concession was rightly made. For the reasons I have given I think that this implied undertaking by the building owner extends to those things which the architect must do to enable the contractor to carry out the work and that the building owner is liable for any breach of this duty on the part of the architect.”

In addition, there is the compelling reasoning contained in the Australian decision Perini v Commonwealth [1969] 2 NSW 530. In that case, it was held that the employer was liable for the failure of the certifier to perform those duties properly. The certifier was an in-house person, but that makes no difference in principle.

The reasoning of the Singapore Court of Appeal was that when an architect certifies, the architect is exercising a professional skill, opinion and judgment and must act fairly, impartially and independently. In so doing, the architect cannot be the agent of the building owner, because such impartiality is irreconcilable with the primary duty of agents to protect the interests of their principal. Therefore, building owners do not undertake or guarantee that the architect will exercise those powers reasonably.

In my respectful opinion, the well-entrenched English law is to be preferred.

⁴ See also the FIDIC New Red Book, Section 14 (Editor's note).

Constraints on the Activities of Design Consultants and Certifiers through Attempted Cost Savings

Some developers seem to think that if they do not provide adequate certification during the period of the building project, nor pay fees sufficient to ensure that there is proper certification, somehow at the end of the day they will be able to fudge the position and the potential problem will go away. This is bizarre. It never happens that way. The certifiers need to be identified at the outset, be employed under terms of reference which will satisfy all third parties with an interest in the project, and be paid appropriately. Consultants who have a certifying role must stand up to any pressures which run contrary to such a necessary approach.

The original or novated consultants must be properly paid for their design, supervision and certification obligations. If their fees are unreasonably cut or they are allowed insufficient time to discharge their duties then, of course, there will be problems. Of course things will not be done properly. Of course there will be deficiencies in the work.

One of the many things which puzzles me about the terms of engagement of, particularly, architects, is that they draw a distinction between simple observation and a more thorough form of inspection. Yet, if the architect is going to be relied on later to certify practical completion, it is difficult to see how he or she can properly do that unless providing more than mere observation during the progress of the work. Perhaps the problem is with my lack of understanding of what these terms mean but I can say that in a number of arbitrations the problem is a real one. The architect has been paid to 'observe' but at the end of the job has simply issued a certificate of practical completion on a wing and a prayer, because such 'observation' has really not been enough to form the basis of the issuing of the certificate.

Certifiers (whether salaried in-house staff of the employer or not) must stand firm and act objectively and independently. Unquestionably, the vast majority of certifiers set out to do their work fairly and conscientiously. But it is very difficult for them to do this if they are pressured by an unscrupulous employer, especially if they have been silly enough to take on the job for an uneconomic fee.

Inadequate Supervision — poor quality work

While there is a body of law which makes it reasonably clear that a poorly supervised contractor cannot escape liability through lack of adequate supervision, it is quite inappropriate for an employer/developer to rely on that strict legal position. Yet it is surprising how often the developer will give a contractor a free hand, and then complain at the very end of the job when there is a disproportionate amount of remedial work to do. This is an example of false economy at its worst, yet it is such a common occurrence. Of course, a contractor is obliged to work in a workmanlike manner. But anyone involved with the building industry will know that even the most conscientious and professional contractor will have lapses

within their internal supervisory forces and it is simply false economy to think one can pick everything up at the end of the job. Proper regular independent supervision is essential and, at the end of the day, by far the cheapest option.

One of the difficulties with major engineering works is that a plant may not quite function to specified capacity and the question then is — what happens? Does the employer make the contractor remove the turbine (performing fractionally under the specified minimum rating) and return it to Germany or Japan, with all the consequential delays, even though that might be at the contractor's expense? The short point is that no employer will want to do that. Yet if that is, effectively, the employer's only real remedy the employer is simply caught short. Certainly the employer may have an entitlement to damages but they will be difficult to compute. There can be similar problems, in principle, with much smaller jobs — even in house building.

Accordingly, I have introduced a pet provision in contracts, to the effect that where there is defective or faulty work then the employer may at its option, either require the work to be remedied, or be compensated. Compensation will be either on the basis of the loss to the employer, or on the basis of the remedial cost avoided by the contractor, whichever is the greater. This provides an enormous incentive to a contractor to get things right from the start, but it is not an unfair provision overall.

The Human Factor in Contract Failure

Ernesto Henriod

Introduction

This paper sets out to review some of the human foibles which underlie most contract failures, and discusses some examples of failure caused by errors of omission or commission — all due to the human factor. They are drawn from my long experience in the international arena with consulting and contracting companies and the World Bank, and in New Zealand and Peru, my native country.

The Human Factor

Contracts are presumed to bring about a meeting of the minds. They are presumed to be agreements to perform certain functions for the benefit of one of the parties, in exchange for a consideration to be received by the other party.

In a perfect world,

- the parties will act in good faith;
- risk will be allocated fairly;
- the contract will take care of all the circumstances of project execution;
- cash will flow without problems, and so on.

In sum, there will be no cause for any of the parties to the contract to seek extra compensation for a real or fancied grievance.

However, we do not live in a perfect world, nor is it a world ruled by mathematical equations and models. The toughest aspect of management deals essentially with the knowledge of human nature and its weaknesses. A manager must be sensitive to human failings; he or she must be able to identify and deal with human problems and emotions.

Most problems of contract management arise from misunderstandings, lack of communications, lack of knowledge or skills, gullibility, ignorance, greed, arrogance, intransigence, aggressiveness, insolence, timidity, complacency, laziness, negligence, chauvinism, or dishonesty, to name but a few. They are not listed in alphabetical order, nor in the order of their importance: each of those human failings can bring about a serious disruption of a project, or its utter failure. They apply to the large and the small, housing, civil works or major industrial plant — any size or kind of project can fall prey to such shortcomings.

All projects require managers, and managers must manage people: they can only achieve results with people. Managers cannot expect to do everything by themselves, have a finger in every activity that takes place around the project.

Likewise, they cannot expect to be masters of all the technology and skills involved in managing a complex project or a factory. A manager must be, in essence, a delegator, a person that surrounds him or herself with the right people, and then empowers them to act, or draws from their counsel to reach executive decisions — that are carried out by others.

The problems usually start at the inception of a contract relationship.

Take for example, a contract that goes sour because a key circumstance that is peculiar to the project was not foreseen when writing up the contract, by willing or unwilling omission. The contract then has a major inception flaw which later results in a serious problem and leads to a dispute between the parties:

- was it arrogance of the parties — they knew better, they would just use an existing form of contract without adjustment, or without consulting with a lawyer.
- Or was it laziness, negligence or ignorance — take the easy way out, copy the existing form, and be done with it!
- Or — did one party rely in the gullibility of the other party, and introduce a ‘trick’ clause which would open opportunities for claims or unpaid extra work? Or ...

The pitfalls in contract management cannot be ranked as to their importance or economic significance. At most we can identify them and class them as to their origin. They are not accidental: they are created by one or both parties (or more parties, in a multi-party agreement). Hence the listing which appears at the end of this paper. Is it complete? It would be presumptuous to claim such crystal ball clairvoyance ... but it’s a start. And let me stress, at this point, that many of the causes listed can pertain to more than one of the actors in a contract — owner, designer/project supervisor, and contractor.

I will not review each of the items in the list; rather, I will give you some illustrations from cases from my own experience.

A disturbing case: Kariba Dam, Second Stage

I will start by quoting from a book that is an eye opener for all engaged in international business. The book had a very strong impact on me the first time I read it, to the point that it became almost an ‘own experience’ — particularly as I knew some of the characters involved. The book was written by David Morrell⁵, Managing Director of one of the largest British contracting companies of the 1960s and 1970s, Mitchell Construction. It is called *Indictment* and it portrays a worsening environment of the construction industry in the UK over those decades, leading to the demise of Mitchell Construction after the catastrophic failure of the

⁵ David Morrell, *Indictment: Power and Politics in the Construction Industry*, Faber and Faber Limited, London. ISBN 0-571-14985-5.

contract for the second stage power station for Kariba Dam, jointly owned by Rhodesia (now Zimbabwe) and Zambia.

In essence (and to quote from Morrell's book) the Kariba dispute arose because of a radical difference in the quality of the rock expected to be present in the excavation of the huge underground machine hall — “as given in the contract documents and warranted to be accurate” — and those actually found after excavation started. Whilst the bid had been prepared on the expectation to find sound granite, requiring only minor support during excavation, the actual rock encountered was very poor, requiring radical changes in the sequence of construction, and massive support.

In a further quote from the same book, a panel formed by two prominent rock scientists, and chaired by a barrister nominated by the Owner concluded that:

- (b) *“as to the factual accuracy of the borehole records referred to in clause 12(3)(b)(i), the Panel finds that they were NOT factually accurate*
- (c) *as to whether the conditions encountered in the Machine Hall could or could not reasonably have been foreseen by an experienced Contractor at the time of tender, the Panel finds that the said conditions could NOT reasonably have been so foreseen.”*

In spite of this definite statement by the Panel, Morrell and his company found themselves fighting a losing battle with the supervising engineers, the client and the insurers, while construction continued at Kariba, demanding millions of pounds sterling in extra work and extra shoring and protection, with the project being considerably delayed by the actual site conditions. According to *Indictment*, the Owners and their consultants refused to acknowledge the problems and pressed the Contractor for timely performance as per the original Contract schedule.

In sum, Mitchell lost the case, and the company went into liquidation. The underlying problems that brought about the Kariba disputes:

- did they arise from an oversight of the Engineer?
- Did the Owner place unreasonable demands on the Consultant and Contractor?
- Should the Contractor have taken extra precautions when examining the bid documents and the actual site and borehole cores, given the massive underground excavation to be undertaken?
- Or—did Mitchell make use of a perceived loophole, ignoring the evidence of the existing geological core samples in their bidding strategy?

I shall leave you to draw your own conclusions, reading Morrell's book.

A Case of Wise ‘Abstention’

At about that time, I was part of a team (with another British contractor) bidding for a 20 km long tunnel under the Andes, in Central Peru. The tunnel was planned across a major ridge, with 2,000 metres of rock cover over the middle section, and major faults crossing the tunnel line, with the certainty of water intrusion. My employers wisely refrained from bidding a firm price and instead proposed a target contract, which was rejected by the owners. Another contractor got the job; huge increased costs and disputes followed. Needless to say, the project took longer than anticipated, and cost several times more than the original estimate, as well as many lives. I was young and anxious to go ahead with the challenge of the long tunnel — and greatly disappointed when we refrained from bidding. But later on I realised the importance of the lesson, and how wise the decision of my employers had been.

A Case of Over-eagerness

By contrast, another major international firm came into severe difficulties when it ignored basic principles of caution in entering a new market: they were eager to enter the huge market of an emerging Asian nation. The international firm allied itself with a local firm to bid for the contract for a major motorway. The foreign firm was to provide technical know-how and management, whilst the local company would furnish all the heavy construction equipment. The two members of the joint venture would be jointly and severally responsible for the contract.

After the contract was signed, and the foreign personnel had arrived on site to start work, it was found that the local firm’s equipment was otherwise committed, and would not be available for the contract. The local firm had no additional financial resources to acquire more heavy equipment. Meanwhile, the expatriate personnel and families already in the country could face problems with the government. It cost the foreign contractor a large sum (double-digit millions of dollars) to extricate itself out of the contract and repatriate its staff. In their keenness to get the contract, the managers had failed to ascertain that the actual equipment was available before embarking on a major contract. A simple physical inspection would have shown the location and availability of the equipment.

International Consortia and Joint Ventures

Many problems can arise in joint ventures, consortia, or other forms of association between international and local firms from developing countries. Trusted local legal counsel must be engaged to draw agreements that will protect the partners in terms of the local laws. One common failing is that of sharing management responsibility: the association agreements may appoint foreign and local ‘co-managers’ to manage the joint venture. If the local manager is not up to strength, or simply does not turn up at critical times, decisions may be left to the expatriate manager. If matters go wrong after one such decision is taken unilaterally (regardless of the lack of capacity or absence of the local counterpart), a major dispute can

arise among the partners that can lead, in extreme cases, to abandonment of a contract or a major dispute with the client.

Client Supply of Critical Components

A project for the supply, erection and commissioning of a manufacturing process involving four separate stages was bid by the owner in three packages, for each of the first, second, and fourth stages, reserving the third essential stage for its own national company. International companies, anxious to enter this important new market, won contracts for the other three stages. The three foreign companies performed on time, and expected to be paid in full. However, the contract required that the production chain be fully functional, with proven production quality and volume, before disbursing the last payments. The third stage was not available on time and thus, the client would not pay for the three foreign-supplied stages, since production was not possible.

- Another case of over-eagerness for sales?
- Should the bids have been tagged to counter the risk of a delay caused by the local supplier?
- Should the foreign firms have allowed for delays within their bids?
- Could the foreign firms have lost contract awards by adding a cushion for delays?

The last example illustrates a potential source of problems, when an owner, looking for economies, undertakes the supply of components essential to the overall performance. For instance, delays have arisen in pipeline projects when the pipes to be supplied by the owner fail to arrive on time. Further, the owner then acquires a contractual responsibility for the performance of the materials supplied, in terms of time and quality. The owner may become liable to delay claims, negate liquidated damages, or simply, void the warranties provided by the contractor.

These are examples of what happens at the conception and tendering stage of projects. Contractors and suppliers can be gullible and fall prey to their own desire to establish themselves in new, attractive markets. Owners can try to arrange the supply of inputs to suit their own convenience — or may dictate forms of contract that are not the best suited for the project — for legal or political reasons. And less-than-fair or -truthful dealing can enter the equation: human failings!

A Major Source of Issues: the specifications

Specifications are often the root cause of disputes. In some cases, the specifications are defective or unclear; however, the more frequent case is that those carrying out a contract ignore perfectly sound specifications.

Take the case of an airport to be built in the Peruvian Andes, near a major tourist area, in mountainous, high-altitude terrain. The contract with the project consultants, a large international engineering firm, required that they design a runway capable of handling Boeing 727-200s, taking off with 120 passengers and full luggage. The consultants ignored this requirement and, considering that the airport would service an important tourist destination, designed the runways for 747 aircraft—a much larger and powerful airplane. However, the local fleet, consisting mostly of older 727-200s would have to reduce their payloads by at least one half to be able to use the runway, as designed for the 747 takeoff characteristics. The runway had been sited on a plateau with limited expansion possibilities. A long dispute followed, involving two governments and international agencies. But, in essence, one of the basic contract requirements had not been fulfilled.

'Industry Standards'

Engineers and architects often resort to general references to industry standards, when specifying equipment. The new World Bank Main Complex in Washington DC, included an industrial-scale kitchen in the second basement, requiring large ventilation ducts running up the equivalent of about 16 storeys, to extractor fans and diffusers in the roof service area. The architect vaguely specified a published industry ventilation standard. Under one category, 'Office Buildings', the standard could be interpreted as requiring relatively light plate and few supports along the riser shafts. The contractor bid on this basis, and installed the light plate ducts, whilst the architect's personnel supervised construction and did not raise objections.

The ducts failed in operation: first, vibration was noticed in offices adjacent to one ventilation shaft; then, the Bank's maintenance engineers noticed there was insufficient draft from the extraction system, and installed a 50% more powerful extractor fan on the roof, without consulting the architect. While working on the fan upgrade, the extractor fan cut-off switch for the kitchen buffers was disconnected.

Collapse followed, with general finger-pointing:

- the architect's specification had not been clear;
- the contractor should have known it was an industrial-scale kitchen and should have supplied a strong enough duct;
- and the owner had interfered with the system, increasing the extraction power and disconnecting an essential switch.

Whilst a dispute was avoided through the partnering arrangements applying in that contract, and the cost of repairs and upgrading of the ducts was shared by all parties, the costly remedial work and commissioning delays should have been avoided by correct specification and supervision, with good communications among all parties. Once again, human error or omission: insufficient attention to detail in the specification, lax supervision, and poor communications.

Client Eagerness: ‘fast track’ projects

Fast-tracking means: cut corners with the schedule, start construction before all drawings are complete, design and build as you go. If the project is simple, and the sequencing is straight forward, problems may not arise. But if the project is complex, fast tracking can be a recipe for disaster.

A large office building, of over two million square feet, was to be built in three stages.⁶

Construction of the structure for the first stage started before the service drawings had been finished — and the owner and the architect were still arguing about what the services would look like. When the plumbing, electrical, HVAC and communications drawings were finished, it was found that most of the slab penetrations were in the wrong place. There were over 5,000 variations involved in the early stages of the project. Why did this happen? It was a combination of the owner’s lack of preparation and understanding of what was involved in the project, an architect determined to do the job, come what may, and a contractor who was only too happy to oblige — and price the variations in a captive market.

In Conclusion

We have read the Papers written by eminent professionals, telling us about efficient means to achieve timely results in project execution, by making use of the newer forms of contract, and the new approaches at preventing and resolving disputes. Whatever course is chosen, the human factor shall be the primary cause of success or failure in any enterprise. This is particularly true when considering partnering, and other forms of contract that come away from the traditional adversarial relationships, engineer/contractor or architect/contractor, and rely essentially on goodwill and understanding.

The examples given in this paper are but a few instances of contract problems arising out of human errors or failings. The listing that follows — which the writer presents as a “first sketch” — should warn us of where to look for some of the more obvious potential causes of contract failure.

Common Causes of Problems and Disputes in Contract and Project Management

The Owner

- Ill-defined requirements, timing, financial provisions.
- Poor choice of consultant: engineer, architect, project manager, quantity surveyor, accountant, or legal advisor.

⁶ For a fuller description, see Chapter 9, page 163

The Causes of Contract Failure

- Poor prequalification and tendering procedures, or abuse of those procedures, including two- and three-envelope selection; careless analysis of bids.
- Award to the lowest bidder, regardless of qualifications and experience.
- Lack of legal/contract support.
- Lack of management and financial control capability.
- Insufficient delegation to contract management representatives or, conversely, delegation without accountability.
- Interference with contract management. Opening up an 'Owner's window'.
- Changing requirements as the contract proceeds — excessive number of owner-driven variations.
- Protracted payment procedures, hampering cash flows to consultants and contractors.
- Corruption.
- Poor communications.

The Consultant⁷

- Fraudulent presentation of qualifications and experience.
- Highly qualified personnel listed in a proposal for consulting services are replaced with lesser ranking staff for the actual job.
- Incomplete site investigation: incorrect or defective information is gathered/published and used for design and estimating.
- Poor drawings or specifications.
- Errors or omissions in drawings or specifications.
- Internally conflicting documents (contract/drawings/specifications).
- Poor estimating and cash flow projections.
- Insufficient attention paid to programming and scheduling.
- Arrogance, condescension or intransigence displayed by contract or project manager/supervisor in dealings with the contractor.
- Corruption.

⁷ In this note, 'Consultant' includes one or more of the professionals usually engaged by an owner (or forming part of the owner's own staff) to design a project, assist in the tendering and award process, and supervise implementation.

- Poor communications.

The Contractor

- Fraudulent presentation of qualifications, experience or financial strength.
- Poor evaluation of contract documents, poor estimating.
- Poor site management: lack of experience of contract manager and personnel.
- Insolent or abusive attitudes vis-à-vis owner or consultants.
- Abusive pricing of variations ('captive market').
- Financial difficulties.
- 'Short-changing' — materials that do not conform to specifications, production short-cuts.
- Corruption.
- Poor communications.
- Failure of joint ventures, consortia, or other forms of association.
- Strikes and other labour unrest, caused by the contractor's own failings or in subcontractors' or suppliers' shops.

External Causes

- Natural phenomena usually associated with weather: rain, wind, flooding and so on. Poor assembly or description of historical records in the bidding documents, or poor provisions (e.g. for wet weather) by the contractor.
- Strikes: transportation (local and international), services (utilities).
- Utility failures: interruptions of power and water supply, disruption of telecommunications.
- Political interference.

Other causes of disruption usually affect whole countries or regions (e.g. general strikes, wars and revolutions) or are deemed 'acts of God', i.e. beyond human control — such as earthquakes. The contract should refer to these and describe how they will be dealt with.

The owner and the project manager should be concerned with a key question: how have we provided for these types of problem in our contract, or in the terms of our association with other consultants or contractors?

The Resolution of Disputes

Ian Barker, Nael G Bunni & David Williams

In the previous chapters we have reviewed the latest developments in contract forms, and the various methods of dispute *prevention* that have been introduced in the last decades. We have also discussed the culture change that has been taking place in the construction industry, tending to move away from an environment of confrontation, and realizing that all parties tend to gain when working in a culture of good faith, collaboration and mutual respect.

Nevertheless, much as the industry tries to enhance this refreshing, positive approach, we will always have to contend with human failings and, whether we face a difficult Employer, Engineer or Contractor nationally, or we decide to venture to do business internationally, we may be faced with an issue that escalates beyond prevention measures such as the contract neutral, or initial attempts at defusing — be they amicable settlement, negotiation, mediation, or other form of alternative dispute resolution.

We may therefore have to engage in arbitration — the means for dispute resolution included in most contract forms as the ‘end of the line’, the final recourse to settle an issue which cannot be resolved by the parties to a contract by more expeditious and less onerous means. In this chapter, three eminent specialists discuss alternative dispute resolution and arbitration:

Ian Barker discusses dispute resolution in New Zealand today, and some issues of international business;

Nael G Bunni presents his views about international arbitration, with particular reference to the Construction Industry; and

David Williams writes about international commercial arbitration and international conciliation.

Parts of these three important papers may repeat certain principles or concepts. Nevertheless, we have decided to retain them as written by their authors, so that the reader will benefit from the full development of the subject as visualized by each writer.

The reader’s attention is particularly called to Nael Bunni’s listing of activities under ‘Case Management’ (page 223) and the voluminous amount of paper and preparation work suggested prior to the start of arbitration proceedings. This exercise would lend credence to Martin Barnes’ views on arbitration (see Chapter 6). Conversely, David Williams’ paper, when discussing ‘Multi-tiered Dispute Resolution’ (page 238) casts doubts on the usefulness of pre-arbitration procedures such as normally grouped under the umbrella of ‘Alternative Dispute Resolution’: DRBs, DABs, Adjudication, Mediation, and so on.

The jury is still out on the Barnes/Williams debate (see pages 88 and 238). You, the readers, are the jury.

Dispute Resolution in New Zealand today

Ian Barker

Introduction: Dispute Resolution Methods

The basic methods of dispute resolution are:

- negotiation;
- alternative dispute resolution;
- arbitration; and
- litigation.

Whole libraries have been written about all of these basic methods. In the course of a chapter such as this, one can but touch on some of the advantages, disadvantages and characteristics of each method.

In making the decision as to which method of dispute resolution to employ in any conflict situation, the following considerations will feature in varying degrees of prominence:

- cost;
- speed of resolution;
- confidentiality;
- best interests of the parties, including the impact on continuing relationships;
- flexibility; and
- fairness and effectiveness.

Apart from the rationale behind the Construction Contracts Bill, construction disputes seem rarely to have placed over-reliance on speed of resolution.

Negotiation

Negotiation is familiar to you all. We practise it in our daily life. In some cultures, it is an indispensable part of living. Parties to a dispute can resolve it amongst themselves, sometimes with and sometimes without the benefit of other professionals. Human nature being what it is, it is not easy for negotiations to occur fairly and with all parties being even marginally objective about the issues. That is why parties frequently need the assistance of an impartial third party to assist them to assess the reality of their positions. In negotiation, there is often one party who proves to be the more aggressive or stronger, or who is perceived to have more power over the other party.

Negotiation is private, speedy, cheap and can allow existing business relationships to continue. It is not always easy to perceive it as objectively fair. Negotiating styles, tailored to a particular occasion, are often as important in obtaining a settlement as the negotiations themselves. Negotiation often takes place before the merits of the dispute have been fully explored, which can be a disadvantage and which can lead to attempts to re-open a dispute once relevant matters, previously unknown, emerge.

Mediation and Other ADR Techniques

The drawbacks of negotiation have led to the modern popularity of mediation and other ADR remedies. Mediation calls for the assistance of a mediator who is a skilled and independent third party who manages the private negotiations between parties and assists them towards a settlement. Parties have to agree to mediate: the best result from a mediation is a signed, negotiated settlement.

Mediation styles vary: learned treatises have been written about mediation techniques, many by American academics. I have never found these works particularly helpful personally, although some mediators do. There are two main styles of mediation: the first is when the mediator is a person skilled in bringing parties together and in operating a process that ends in a settlement. The second is where a mediator, perceived to have some idea of the legal and/or technical subject matter of the dispute, may assist the parties towards a settlement by offering reality checks and by opining, if asked, on how they might fare in arbitration or litigation. Such a mediation normally requires comprehensive background information being made available to the mediator. It is called 'evaluative mediation'.

Most mediations of whatever style start with a public statement by each party nominating concerns and stating what that party seeks from the mediation. This is a helpful process because it enables the parties to 'eyeball' each other, often for the first time. For example, it enables managing directors to find out what their subordinates have really been doing in their company's name. It can show an insurance claims manager that a claimant is not a fraudulent person, but actually quite a decent, reasonable one. Lawyers are helpful at a mediation in my experience: I personally will not conduct one without them. Their role is not that of an advocate to present evidence or to cross-examine, but to assist the parties towards a settlement and, if necessary, to discuss issues with the mediator.

In many mediations, the mediator caucuses with each party separately, but may not discuss anything told to him or her in confidence without the consent of the other party. Often, such a mediator acts as an emissary to take offers and counter-offers back and forth. In such a mediation, offers should not be made in open session because of the 'loss of face' potential if an offer were not accepted. Parties are advised against ridiculous offers: they should always try to assess what effect any offer will have on the other side. Various people have various needs at various times and, for some, one type of mediation might be suitable on one occasion, and not on others.

There are other forms of ADR, such as expert neutral determination, which can be particularly useful in construction disputes. This is a hybrid between mediation and arbitration, where the expert makes either a binding or non-binding settlement recommendation to the parties on the basis of submissions presented. It is popular in Australia but I have not heard of its great use here.

There is the 'mini-trial' where parties present, usually to a retired Judge or to a barrister, statements of evidence and submissions. At the conclusion, the neutral evaluator gives an idea of what the decision of a Court might be, based on the evidence and submissions heard, but without cross-examination. This procedure is favoured particularly in Canada but has not yet found much favour in New Zealand, for reasons which escape me.

Mediation and other forms of ADR have the advantage of cost-saving. Most mediations (even complicated ones) can be over in two or three days at the most. Often a court case or arbitration over the same topic would take weeks. The cost of the mediator is much less than that of an arbitrator who has to spend time writing a reasoned award and closely studying the documents. Often the mediation is held before lengthy preparations for litigation or arbitration are undertaken.

There is the obvious advantage of confidentiality because all parties and the mediator agree to confidentially; both parties can have their say in a relaxed and non-threatening forum. A good mediator does not allow a stronger party to exert undue pressure on a weaker party. With mediation, there is always the prospect of continuing business relationships and there is not the trauma often associated with adversarial cross-examination during arbitration or litigation. There are no rules of evidence at mediations. People can say what they really feel, either in the open session or to the mediator. This ability can have a cathartic effect, which often releases the willingness to settle, a sentiment that often has little opportunity for expression in the structured realms of arbitration and litigation. In construction disputes, mediation can be desirable because of its speed and efficiency. However, more than in other types of dispute, there must be a real willingness to settle and a disinclination to agree over minutiae, particularly of quantum. The 'broad brush' approach is called for.

Arbitration – General

Arbitration is a more formal dispute resolution process whereby the parties refer their dispute to an independent, qualified third party for binding determination. In effect, arbitration is a private Court case where the parties choose the 'Judge'. It can have the advantages of speed and the saving of expense. In my experience, speed in arbitration can be sacrificed by the intent of some lawyers to run an arbitration just as if it were a Court case, with all the panoply of pleadings, discovery, pre-trial briefs, interlocutory applications, etc. Not all arbitrations have to be like that and many construction arbitrations are not.

Arbitration can, however, be cheaper than litigation although, at first blush, this

proposition may not seem to be so. The arbitrator has to be paid, whereas the Judge is provided by the State. (However, the latest recent increase of High Court hearing fees to \$2,200 per day is good news for arbitrators and mediators!). In an arbitration, the parties have to pay for the venue and recording of evidence (if needed). However, given the uncertainties of, and the delays in, obtaining Court fixtures, the advantage of an arbitrator who knows the subject matter and in whom the parties have confidence, is a definite advantage. The ability to choose an early, fixed hearing date, without the uncertainty of Court dates, can make arbitration cheaper in the long run, particularly if it can be brought on promptly, given the saving in executive time. Moreover, the ultimately successful party is not kept out of its money for as long as it might otherwise. There is a right of appeal from an arbitrator's decision but only on a point of law and only if either of the parties agree in advance, or the Court gives leave. The Court of Appeal decision in the *Doug Hood* case makes the instances of leave to appeal on a point of law fairly rare. This is an affirmation of arbitration. The Courts take the view that if the parties agree to arbitration, that is what they will get.

New Zealand is fortunate in having a new Arbitration Act, based on what are known as the UNCITRAL rules. These rules were devised by a United Nations Agency and are used by many countries throughout the world as a benchmark for the conduct of both domestic and international arbitrations. The aim of the new Act is to provide for the speedy, inexpensive and confidential determination of disputes referred to arbitration. The arbitrator is given wide powers that can be adopted or not adopted by the parties as they choose. These include the ability to receive evidence that is not necessarily admissible in a Court and to act in accordance with equity and good conscience on the perceived merits of the dispute. There is also the ability to act in an inquisitorial fashion, something which I note has now popped up in the new Employment Relations Act. This is allegedly based on the European system of fact-finding. I have to say that many lawyers in preparing arbitration agreements cross out this option in a 'knee-jerk' way, without bothering to think of the advantages it could give to the arbitrator.

Arbitrations can proceed similarly to a Court case with cross-examination: there is room for innovation and expedition. There is the disadvantage in arbitration, shared with litigation, of the ability for damaging statements to be made under oath which may corrode the future relationships of the parties. Arbitration has the advantage of confidentiality. I shall have something to say on the choice of arbitrators at a later time in this chapter.

Arbitration – Domestic and International

There are two kinds of arbitration: domestic and international. I say no more about domestic arbitration, with which you are probably familiar. I shall speak about international arbitration. It may well be that those with whom a New Zealand party is in conflict in a construction contract may be from another country. It is usually better to resolve your dispute by way of arbitration with a party in another jurisdiction than to litigate either in the New Zealand Courts or in Courts overseas.

The reasons are fairly clear: first, an agreement to arbitration selects the forum, thus avoiding problems of jurisdiction that are always present in litigation. If an aggrieved party decides to litigate in the Courts in its own country, there is always the potential for the defendant to dispute the jurisdiction. National courts vary as to both the general competence and/or the experience of the judiciary in technical topics. There can be 'demarcation disputes' between state and federal jurisdictions. Some US states have elected Judges who have to run for re-election, whereas Federal Judges are appointed for life. Even Australia has demarcation disputes, admittedly now fewer as a result of special legislation. An international arbitration can provide a neutral forum for adjudication not tied to the judicial or political views of either party to the dispute. Under most modern national arbitration laws, judicial intervention in the arbitral process is minimal. One should avoid a jurisdiction that allows too much judicial interference.

Secondly, confidentiality (applicable to domestic arbitrations as well), specialised competence, procedural flexibility and speed can apply to international arbitrations.

The third and greatest advantage of international arbitration lies in the enforceability of awards. Under what is known as the New York Convention, arbitral awards are easy to enforce worldwide, more easily than the judgments of national Courts. The New York Convention, incorporated into the New Zealand Arbitration Act 1996, makes arbitral awards rendered in more than 100 convention states enforceable in other convention states, such as New Zealand. There are only limited defences against registration and enforceability.

There is no comparable worldwide treaty for the enforcement of court judgments. Lawyers who have had occasion to use the Reciprocal Enforcement of Judgments Act 1934 find it is not always easy to register New Zealand judgments, even in similar jurisdictions to our own, such as Australia or the United Kingdom. It is always very expensive. As for registering in countries not covered by that Act, such as the United States, one might as well forget about it, particularly if the judgment is to be sought to be registered in a State Court not particularly attracted to foreign litigants. There is no comparable problem in enforcing international arbitration awards. If there has been a competently-run arbitration, especially one processed through an international arbitration centre, the chances of being unable to register the resultant award are slim.

International arbitration can be either institutional or *ad hoc*. Institutional arbitration means that the parties choose a particular institution, such as the International Chamber of Commerce (ICC) in Paris, the London Court of International Arbitration (LCIA), or the American Arbitration Association (AAA). There are numerous other arbitration centres, for example in Hong Kong, Singapore, Kuala Lumpur, Melbourne and Vancouver. These institutions fulfil various roles, including:

- assisting the parties in the constitution of the arbitral tribunal;
- having formal arbitration procedures that the centres supervise to varying extents;

- collecting the likely costs of the arbitration in advance;
- determining the arbitrators' fees; and
- charging administrative fees for their services.

They do not adjudicate on the merits of the dispute, leaving that to the arbitrator. The ICC by exception scrutinises awards before they are issued and makes suggestions to the arbitrators based on the ICC's knowledge of the file. This procedure is supposed to instil confidence in ICC awards. New Zealand has only recently become a full member of the ICC and, as such, has a member on the ICC Court in Paris and a member on the ICC Arbitration Commission.

Obviously, an arbitration administered by an institution is going to cost more and is likely to take longer because of the inevitable bureaucracy which helps to resolve procedural difficulties and ensures that the finished product is satisfactory. The costs of the arbitration are usually paid 'up front' to the institution and there is thus no possibility when the arbitration award is released of one party being unable to pay its share of the costs.

Litigation

The facility for litigation is provided by the State in accordance with its obligations to provide citizens with a suitable forum for resolving their civil disputes. Legal costs are always a factor when deciding to opt for litigation. In most mediations, the mediator will invite counsel for both parties to submit a 'best case' and 'worst case' scenario based on the likely costs of litigation and of possible appeals. The legal costs of actually running litigation are about the same as that for arbitration, if one excludes the cost of the arbitrator and the venue, etc. Litigation has a certain right of appeal which arbitration does not have. Although there is some limited judicial specialisation with the Commercial List in Auckland, you have to take whatever Judge the system allocates to you. Courts operate under established rules of evidence and within well-known guidelines. You cannot pick either your Judge or the time of the court hearing in the same way as you can both pick the arbitrator and arrange for a suitable hearing date for the arbitration.

Courts in New Zealand and in other similar jurisdictions have 'improved their act' considerably in recent years. The Woolf Reforms in England have obviously been designed to make civil litigation in that country much more efficient and 'user friendly', to coin an IT phrase. The Rules of Court in most jurisdictions, including New Zealand, have been changed to avoid the 'cards close to the chest' syndrome, which was a characteristic of so many advocates of yesteryear. Parties are encouraged in the interests of obtaining a settlement as much as of saving court time, to present their evidence in advance by means of prepared briefs. There are Conferences at which Judges inquire whether the case is possible to settle: quite frequently, strong hints are given to parties to try to mediate. There is not yet in New Zealand a requirement that parties go to mediation against their wishes, as exists in Victoria and Western Australia. My own view is that forcing people to

mediation is not a good idea. A fairly firm judicial nudge can often be effective. Mediation requires an effort of will on the part of all participants to want to settle the dispute. Sometimes that effort is triggered by a judicial nudge.

Cases in Court usually do not enjoy confidentiality, although there are sensible rules about preserving the confidentiality of sensitive business records or intellectual property procedures. If the managing director is to be cross-examined embarrassingly, then he will be cross-examined embarrassingly in a public forum. On the contrary, if there were an arbitration about the same subject matter, the world would not know of it.

Of course, if every case were mediated or arbitrated, the law would not grow on its incremental case-by-case method as it has for centuries. There are still going to be enough determined litigants to keep the courts busy, but I venture to think that the diet of litigation will contain more regulatory proceedings, such as Commerce Act proceedings or administrative law proceedings, or judicial review, which are not particularly suitable for ADR. Construction cases usually reach the Court by way of some remedy sought under the Arbitration Act (e.g. appeal, removal of arbitrator). New Zealand does not have a specialised section of the High Court dealing with construction cases as is the position in England and Victoria. That is why arbitration is favoured. Most New Zealand Judges — dismayed at the prospect of what they perceive as days of boring evidence about quantities, rates, etc — positively discourage this type of case and encourage ADR.

Summary

The above represents a scattergun statement of the dispute resolution options. I have pointed out the advantages and disadvantages of these options. Obviously, parties will be guided by their lawyers. Most lawyers are aware of mediation and ADR as a tool in the resolution armoury. For a time there were lawyers who were ‘sniffy’ about mediation. Some of them, mistakenly, thought it was taking the ‘bread out of their mouths’: in my experience, that attitude has changed quite perceptibly, even over the last two or three years. Smart counsel can see that successful mediation of one case will mean that they can get on with the next one.

Dispute Resolution Clauses

I now touch on something of great importance to dispute resolution. That is the dispute resolution clauses in contracts. I do not think it useful to offer a selection of these: however, I invite you or your lawyers, when concluding contracts, to pay particular attention to the dispute resolution clause that you put in your contract. I know that these clauses are usually found at the end of lengthy contracts after there has been much argument about the principal terms. By the time the dispute resolution clause is reached, the hard decisions have already been made and the parties are looking forward to the obligatory bottle of champagne which symbolically cements their deep and undying love and friendship.

However, when drafting the dispute resolution clause, lawyers should not just take something out of the previous contract that happens, conveniently, to be hidden in the bowels of the word processor. Nor should they be overawed by a printed form clause used by a multinational or a professional organisation. However, they should realise that these clauses have stood the test of time. May I say as an aside that I still see arbitration clauses in contracts signed after 1 July 1997 which refer to the Arbitration Act 1908. I still see arbitration clauses which talk about two arbitrators and an umpire, a procedure which, apart from some long-term leasing contracts, is no longer favoured by the 1996 Act.

General

I make the following points about dispute resolution clauses:

- (a) Decide first whether you want a mediation as a prelude to arbitration. Many contracts nowadays speak of parties ‘negotiating’ before starting the arbitration procedure. I should have thought this provision unnecessary to insert in a contract. As a matter of practical reality, people usually do negotiate initially and proceed to arbitration or litigation as a last resort. Therefore, one can normally assume that unless the parties are completely ‘daggers drawn’, then attempts will be made to negotiate before the arbitration process is triggered. Usually such clauses are fairly meaningless and can often be unenforceable, coming within the ‘agreement to agree’ category. However, their very existence can offer a chance to make delay to a temporising party.
- (b) More important is a clause mandating mediation or conciliation as a precondition for arbitration. Such terms need to be clearly worded and should stipulate what sort of mediation is required, how a mediator will be nominated and what the mediator is expected to do. There can be possible enforcement difficulties if the clause is not sufficiently sharply defined and is too much in the ‘let’s be jolly good chaps’ mode of legal prose which is popular because of the ‘plain English’ mantra.
- (c) I wonder whether it is a good idea to require mediation as a precondition to arbitration. In my experience, most successful mediations of complicated disputes are only successful because the issues have been defined by the preliminary procedures of arbitration in litigation. In many cases, likely evidence has indicated that the parties have an appreciation of their own case and the case of the other side. Unless a ‘broad brush’ approach to dispute resolution is favoured, mediation before the commencement of litigation or arbitration can often be particularly unproductive because nobody is too sure what the issues are.

What I have been trying to convey in this part of the chapter is that, whilst dispute resolution clauses come in all shapes and sizes, it is essential that thought be given when the contract is signed as to what is to happen if things go wrong. Try and mandate the most cost-effective and efficient resolution process in the

circumstances. Do not be overawed by the weight of some party if its standard dispute resolution clause could end up causing you or your client a lot of unnecessary expense. Practical examples from my recent experience:

- (a) In one agreement between an IT provider and a customer, the provider's standard arbitration clauses were extremely convoluted. It required that, whilst arbitration could take place in New Zealand, the contract was to be governed by the laws of a certain State in the United States. It mandated that the arbitrator be chosen by one appointing body for a dispute about a service contract and by another appointing body for another type of contract.
- (b) In another dispute which I encountered on the Bench, the case involved property and companies in New Zealand. The solicitor for the New Zealand party had agreed to a standard clause which stipulated that the contract was to be governed by the laws of Japan — a quite impracticable situation when the Court was dealing with property or companies in New Zealand.
- (c) In an arbitration clause concerning a forestry contract the reference was to three arbitrators "each of 10 years' requisite experience". The clause did not say experience in what. There were several possibilities — forestry, law, science, accounting, to name a few, since the dispute was very broad in its scope.

I mention these instances to show that my concerns are not just imaginary. Problems result often because negotiators and lawyers cease to be vigilant at the end of the negotiation process. Do not be frightened to challenge printed terms. If you have the main items agreed, the larger party with the standard form may not wish to back off just because you would like some fine-tuning of the dispute resolution clause.

Three Arbitrators or One?

Often, one party nominates an arbitrator and the other party, as a knee-jerk reaction, rejects that arbitrator without any real consideration of whether that person is suitable or not. The rejection is often merely because the nomination comes from the other side.

Avoid clauses which require three arbitrators. Most arbitrations are suitable for a single arbitrator, particularly now that a single arbitrator has power to appoint an expert to advise him or her. (Article 26 of the First Schedule of the Act). One does not get three Judges in a Court to hear even a very important witness at first instance: three arbitrators may be necessary for a very important matter involving much complexity or a lot of money, or both, in which case it is usual to have a legal chairperson and at least one expert from the discipline concerned. But the problem of the lack of technical knowledge of an arbitrator can be overcome by having an expert appointed by the arbitrator.

When rather uncomplimentary things are occasionally said about 'non-specialist'

Judges (sometimes in the construction industry), it should not be forgotten that most senior barristers and Judges have had to acquire and absorb information on a whole variety of topics over the course of their careers. If they are any good, they have the ability to absorb technical information and retain it for so long as necessary. For example, I would once have been able to give you a discourse on the molecular structure of amoxycillin, a popular form of antibiotic – but that was almost 20 years ago and I am afraid I have forgotten most of it! In that case, as a Judge I had the equivalent of an expert appointed to assist an arbitrator. Under the Rules regarding patent cases, I sat with a Professor of Organic Chemistry who dealt with the daunting technicalities of stereo-chemistry.

Three-person arbitrations are usually more difficult to organise and to convene in one place for a great length of time. Arbitrators are busy people, prominent in their particular professions. There is also the expense of having to pay for three instead of one. So, if you have an agreement which mandates three arbitrators, do not follow it doggedly. Have one unless there are very good reasons for three. Ideally, do not put in a requirement for three arbitrators unless you have a sound reason for doing so.

Power of Appointment of Arbitrators

There can be situations where the clause in the contract between the parties confers the power of appointment of an arbitrator to some designated person if the parties cannot agree on an arbitrator. Often this is the president of a professional body, such as the local or New Zealand Law Society, the Institute of Chartered Accountants, the Institute of Professional Engineers or the Institute of Valuers. Sometimes, the person currently occupying this role is well-qualified to nominate a suitable arbitrator for the particular arbitration. Quite frequently, he or she is not.

May I suggest that, for greater consistency when drafting such a clause, you should make the nominator the President for the time being of the Institute of Arbitrators and Mediators of New Zealand. Although I am currently the President, I make no apology for so advertising the Institute. It has some 600 members, both mediators and arbitrators. After suitable inquiry by the Institute, some members are included on a panel of arbitrators or mediators whom the Institute can propose to parties for selection.

The President of the Institute, when asked to make a nomination under a clause in a contract, or the Institute CEO, when asked to supply lists of panel members, will take into account the type of dispute before presenting names for consideration. This way ensures that the parties to the dispute receive somebody suitably qualified, not just in the subject matter, but also in the conduct of arbitrations or mediations. Just because a person may be well-qualified in a discipline such as engineering or valuation, that fact does not necessarily mean that that person is also experienced in dispute resolution. Persons on the Institute's list have normally passed examinations on arbitration law and practice. The standards of the Institute are

constantly being reviewed to ensure that suitable nominees are suggested to inquirers.

Overseas Administering Body for International Arbitrations

If you are in an international contract situation, you have to decide carefully whether you have an institutional arbitration or you have an *ad hoc* one. There are the advantage of institutional arbitrations as mentioned, but none of these institutions are wedded to any particular form. For example, you can stipulate that an ICC arbitration be held in New Zealand, with the arbitrators to be appointed from New Zealand. There are traps, particularly for New Zealand parties, in blindly accepting an arbitration clause in a standard form contract — often prepared by lawyers who have no understanding of New Zealand. I give you an example of how this situation has acted detrimentally to local parties.

A dispute arose about some cargo which, when landed in New Zealand, was defective. It caused considerable damage after it was unloaded. There was a conflict between the shipper, the charterer and the owner. Under the standard printed terms of the shipping documents, any dispute had to be resolved by arbitration before a three-person maritime arbitration tribunal in London. There were stringent time limits. The claimants were forced to go through this procedure and incur the costs of appointing three maritime arbitrators in London within the time limit. The hearing had to be in London: most witnesses were in New Zealand, with a couple in Australia. The hearing was largely over quantum because it soon became evident where liability lay. The matter was settled after a mediation. The only alternative to settlement could have been the expensive course of flying all the witnesses to London. If the parties had thought more about this particular shipping contract instead of blindly following the form, they could have had an arbitration in New Zealand or Australia (where the ship ended up), which would have been far more efficient and less costly.

Likewise for ICC, LCIA, AAA arbitrations. In your contract, you can specify the seat of arbitration; you can specify the language of the arbitration; you can specify the pool from which the arbitrators can be drawn, even whilst accepting the administration of one of these agencies. Other factors to consider include whether you want a supervised arbitration, or the additional, but more costly, advantage of the scrutiny given by the ICC. Do you think you can run it yourselves without having to pay an organisation to run it? Do you have doubts about enforceability if any award has not been scrutinised by an international appointing body?

Beware of the ‘colonial cringe’. Arbitrators and mediators in this part of the world are just as competent as those elsewhere. In fact, New Zealand has been well-regarded by the ICC and other international organisations, as is shown by international conferences held in Auckland in recent years: first, the International Convention of Maritime Arbitrators in March 1999; second, an ICC seminar in March 1999 attended by ICC leaders; and third, a joint conference between the New Zealand and Australian Arbitrators’ and Mediators’ Institutes in February 2000.

New Zealand can promote itself as a small and unthreatening nation where an arbitrator is needed from a neutral country for an arbitration where the participants are large multi-nationals from different, powerful countries. The Kiwi 'let's fix it – let's get on with it' attitude is extremely helpful in this kind of situation.

International Arbitration and the Construction Industry

Nael G Bunni

Abstract¹

From their beginning, the pioneering Conditions of Contract issued by FIDIC in 1957 provided for arbitration as the ultimate method for dispute resolution in the contract between employer and contractor. However, by the 1980s, the advantages of arbitration were diminishing: costs were escalating and time taken to complete an arbitration case was becoming excessive. Although not peculiar, in general, to construction disputes, this disenchantment was more focused and felt in the construction field because of the extreme complexity of construction disputology and its many unique features. Most construction contracts, whether or not based on the FIDIC Forms, provide for arbitration as the ultimate method of dispute resolution. This is mainly as a result of the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards.

However, it is appropriate to concentrate here on the FIDIC Forms of Contract as most of the construction in the international field use these, either unaltered or in an altered format, and where dispute resolution is concerned they remain to a large extent unaltered.

Complaints about the excessive time and cost led the draftsmen of the Fourth Edition of the Red Book of the FIDIC Standard Form of Contract to include in 1987 an intermediate step between the dispute arising and the initiation of arbitration. This step, amicable settlement, was made a mandatory step, which obliged the parties to attempt a settlement of their dispute by methods other than arbitration, hopefully simpler, cheaper, quicker and certainly friendlier.

The success of this move by FIDIC led other institutions to follow its example. It also led the draftsmen of FIDIC to delve further into this field of disputology and to introduce into the Orange Book, in 1995, the concept of a 'Dispute Adjudication Board' and later into the Red Book, through a Supplement published in 1996. This development was welcomed by all concerned and was recently adopted into three of the four Standard Forms of Contract published by FIDIC in September 1999, namely: The New Red book, The New Yellow Book and The Silver Book. The fourth form, The Green Book, included a special set of adjudication rules to be applied in case of dispute followed by arbitration if either party is dissatisfied with decision of the adjudicator.

On the practical end, 'Case Management' has been recently introduced in the field of construction disputology by experienced and innovative construction arbitrators in order to establish efficient and cost effective procedures.

¹ Some material in this paper has been unavoidably and necessarily duplicated in a paper entitled "Notes and Current Development — Recent Developments in Construction Disputology", by Nael G Bunni, *Journal of International Arbitration*, Vol. 17, No.4, August 2000.

Introduction: Fifty Years of Evolution

The spread of arbitration as a method of Dispute Resolution in international construction projects may be traced back to the period between 1956 and 1958. In August 1956, the obvious need for a standard form of contract for international construction prompted the Association of Consulting Engineers in the United Kingdom to publish the first edition of its *Conditions of Contract for Overseas Works Mainly of Civil Engineering Construction*.² It was based on the 1955 print of the Fourth Edition of the ICE *General Conditions of Contract and Forms of Tender, Agreement and Bond for Use in Connection with Works of Civil Engineering Construction*,³ and became commonly known as the 'ACE Form'.

In August 1957, FIDIC⁴ adopted the ACE Form and published its own first edition of the "Conditions of Contract (International) for Works of Civil Engineering Construction". This was done with the co-operation of the Fédération Internationale du Bâdtiment et des Travaux Publics (the International Federation of Building and Public Works, now known as the International Construction Federation, FIEC). In addition to some editing changes and a few minor revisions to a small number of clauses, certain important modifications were made to the text of the ACE Form to produce the first edition of the Red Book.⁵

Both the ACE and the FIDIC Forms provided for arbitration as the method of dispute resolution under the contract, mainly because of the fear that in litigation a dispute might end before the courts of at least two different jurisdictions, each competing for supremacy. Such a process is usually protracted and often has overlapping roles with consequential difficulties in the recognition and enforcement of what would then be foreign judgments ending in most cases inconclusively. However, the arbitration clause in both forms stipulated that no arbitration could commence until after completion or alleged completion of the project. Therefore, any dispute arising out of the construction contract, which could not be resolved by negotiation between the parties, remained unresolved for the duration of the construction period.

Then, in 1958, the New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards came into being.⁶ Arbitration immediately became the

² The ACE Form was published jointly with the Export Group for the Construction Industries, and with the approval of the Institution of Civil Engineers in the United Kingdom, for use outside the United Kingdom. It became commonly known as the Overseas (Civil) Conditions of Contract.

³ Although in text and format the ACE Form was based on the ICE Conditions, it differed slightly in some forty clauses and had certain major alterations in a number of others. For details of these alterations, see Chapter 1 of *The FIDIC Form of Contract - The Fourth Edition of the Red Book*, by Nael G Bunni, Blackwell Science Ltd., Oxford, 2nd Edition, 1997.

⁴ FIDIC is the acronym for the "*Fédération Internationale des Ingénieurs - Couseils*" (International Federation of Consulting Engineers). It was originally founded in Ghent, Belgium in 1913 by the national associations of consulting engineers of Belgium, France and Switzerland, but since then it has grown to represent associations from nearly sixty countries around the world.

⁵ For details of these alterations, see Chapter 1 of *The FIDIC Form of Contract - The Fourth Edition of the Red Book*, by Nael G Bunni, Blackwell Science Ltd., Oxford, 2nd Edition, 1997.

⁶ The 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards has been ratified by over one hundred and twenty different jurisdictions worldwide.

preferred forum for dispute resolution in the international field and thus has been influential in facilitating the creation of international construction projects, including the necessary investment and economic measures required for such projects around the world. Of course, this effect was not unique or confined to the construction industry alone.⁷

The ACE Form was short lived as it was taken over by the FIDIC Form, which became better known as The Red Book due to its long-winded title and the fact that its cover was red. The success of the Red Book in the international construction field led FIDIC, in 1963, to publish the Yellow Book, which was drafted for electrical and mechanical works. The drafters of the Yellow Book also chose arbitration as the ultimate method of dispute resolution and here again arbitration proceedings could not be commenced until the project was substantially completed. Successive editions of the Red and Yellow Books continued this trend until 1987 when the Fourth Edition of the Red Book and the Third Edition of the Yellow Book allowed the parties to commence arbitration during the construction period.

Over the years, the prominence of arbitration over litigation heightened. This was exemplified by a number of authoritative statements such as: “No businessman in his right mind seeks litigation.”⁸ However, by the 1980s arbitration began to lose favour with the construction community, mainly due to excessive costs and the time taken by arbitral proceedings. In response, the Fourth Edition of the Red Book, when it was published in 1987, provided for amicable dispute resolution as a mandatory first step prior to proceeding to arbitration.⁹

Only when disputes could not be resolved amicably within a 56-day period, extendable by the parties, could the arbitration proceedings commence. FIDIC, rightly, did not specify the type of amicable dispute resolution forum that should be used because it believed that each construction dispute is unique and may require a special treatment different from that used or adopted in another set of circumstances.

Thus, “Amicable” may refer to any one of the following: Affordable, Available or Appropriate, and includes mediation, conciliation, adjudication, expert evaluation or mini trial.

The trend of moving away from arbitration, except in the more complex and

⁷ The 1958 New York Convention has been described as the “single most important pillar on which the international arbitration edifice rests”; and “perhaps could lay claim to be the most effective instance of international legislation in the entire history of commercial law”. It is reported that an estimated 98% of awards in international arbitration are honoured or successfully enforced and that enforcement by national courts has only been refused in less than 5% of cases, justifying the claim that it is far easier to enforce arbitration awards than court judgments. See “Concord & Conflict in International Arbitration”, The Rt Hon Sir Michael Kerr, The Keating Lecture, King’s College, London, October 1996, page 12.

⁸ Per Professor Sir Robert Jennings, Judge of the International Court of Justice at the Hague in his introduction to the first edition of *Law and Practice of International Commercial Arbitration* by Redfern & Hunter, Sweet & Maxwell, London, 1986.

⁹ The reasons behind that decision were explained in a paper by the author under the title of “Construction Disputes on the Eve of the New Millennium” published in *Arbitration*, Vol. 65, No. 4, November 1999.

intransigent situations, continued in the field of construction up to the mid 1990s. In 1995 FIDIC, following the example of the World Bank,¹⁰ included in its then new Orange Book, the Dispute Adjudication Board procedure, as a first step in the path of dispute resolution.¹¹ This was followed, in 1996, by the introduction of a Supplement to the Fourth Edition of the Red Book where the traditional role of the Engineer acting as a quasi-arbitrator or adjudicator was abandoned and replaced by a Dispute Adjudication Board.¹² Thus what used to be referred to as the two-tier system of dispute resolution has now become a five-tier process (if one includes, as the first step, the presentation of a claim and, as the last step, arbitration) and thus justifiably earns for itself the title of 'disputology'. The path to arbitration, under the 1996 Supplement and its timetable, is shown in Figure 1.

The principles relating to dispute settlement as provided for in the 1996 Supplement to the Fourth Edition of the Red Book continue to be adopted by FIDIC in the first three of its four new forms of contract, published in September 1999:

- The New Red Book — Conditions of Contract for Construction for Building and Engineering Works designed by the Employer;
- The New Yellow Book — Conditions of Contract for Plant and Design-Build for Electrical and Mechanical Plant, and for Building and Engineering Works, designed by the Contractor;
- The Silver Book — Conditions of Contract for EPC Turnkey Projects; and
- The Green Book — Short Form of Contract, Agreement, General Conditions, Rules for Adjudication and Notes for Guidance.

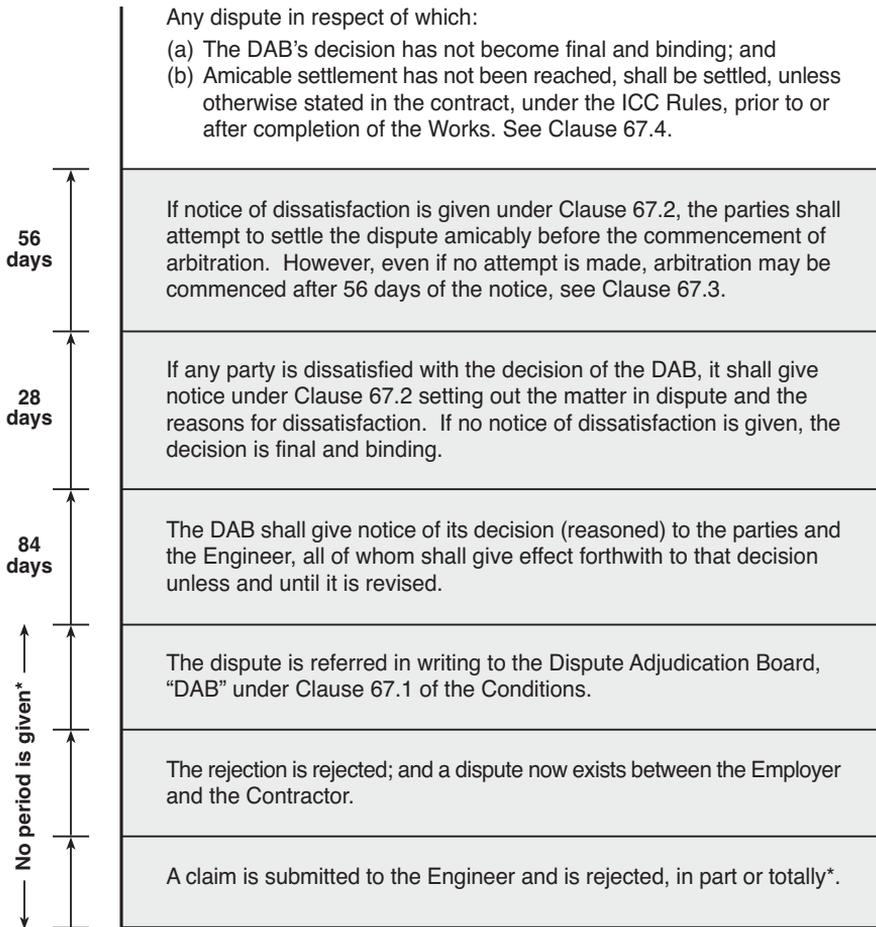
However, there are some subtle differences in the timing and duration of the appointment of the members of the Dispute Adjudication Board in the above forms of contract. For example, it is not envisaged under the New Yellow and the Silver Books that the DAB members are appointed for the whole duration of the project. This is an unfortunate change from the final Test Edition of these forms, since some of the advantages of establishing a DAB on a construction project would most likely disappear by the delay in its appointment.

It must also be noted here that the notice provisions for making a claim have

¹⁰ The World Bank published in January 1995 its Standard Bidding Documents for Procurement of Works financed in whole or in part by the World Bank. These documents were based on the fourth edition of FIDIC's Red Book, but with certain mandatory amendments, amongst which was the dispute resolution clause. The most important of these mandatory changes was perhaps the introduction, in Clause 67 of the Conditions, of a 'Dispute Review Board', which replaced the adjudicator role of the Engineer for contracts estimated to cost more than US\$50 million. (Editor's Note: the 1991 issue of the World Bank's SBD for Procurement of Works already included an option to include a Disputes Review Board in the Contract).

¹¹ The Orange Book was drafted by FIDIC for projects where Conditions of Contract for Design-Build and Turnkey had to be used. This Form of Contract is now obsolete, as it has been replaced by the New Yellow Book published in September 1999.

¹² For a more detailed analysis of the decision to introduce the Supplement to the Fourth Edition of the Red Book, see Chapter 21 of *The FIDIC Form of Contract - The Fourth Edition of the Red Book*, by Nael G Bunni, Blackwell Science Ltd., Oxford, 2nd Edition, 1997.



* It must be noted that there are notice provisions with time limits throughout the Conditions of contract to be complied with when either the Contractor or the Employer intends to make a claim. For further information on this requirement, see Chapter 16 of The FIDIC Form of Contract - The Fourth Edition of the Red Book, by Nael G Bunni, Blackwell Science Ltd., Oxford, 2nd Edition, 1997.

Figure 1: The path to arbitration, under Clause 67 of the 1996 Supplement to the Fourth Edition of FIDIC's Red Book

been tightened considerably under the three new forms of contract. There is now an over-riding requirement under Clause 20.1 of the Conditions for the Contractor to give notice within 28 days, as follows:

“20.1 If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Engineer describing the event or circumstance giving

rise to the claim. This notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.”

Failure to give such notice within the specified period is fatal to the Contractor's claims for entitlement for time and money.

The DAB Procedure was not used in the New Green Book, presumably because it is a short form of contract for minor works. Instead, the resolution of disputes is based on adjudication as a first step followed by arbitration if either party is dissatisfied with decision of the adjudicator.

A special set of 'Rules for Adjudication' was drafted for use in this process. These Rules, which are based to a large extent on the English Statutory Adjudication,¹³ leave the choice to the parties as to whether the Adjudicator is appointed for the whole duration of the contract or within 14 days within the reference of a dispute by one party to the other.

Construction Contracts and Disputology

Construction contracts have many unique inherent characteristics, which distinguish them from other types of contract. It is appropriate to reflect on these characteristics before considering construction arbitration and its own features since they do have a significant effect on how construction disputology has developed. A summary of these characteristics is given below with reference material being suggested in the notes for further reading on this topic.

- Except in a few specified circumstances, the contractor must complete the project, irrespective of what happens and no matter what events take place during the construction period, including accidents and other deterrents;¹⁴
- Construction projects require the expenditure of vast sums of money, frequently provided by banks, financial institutions and insurance companies, which require some form of guarantee as to the safety of the capital they provide for financing the project.
- No two construction projects are alike, even when designed and constructed in a similar manner, for a number of reasons. For example, as soon as a project is relocated onto another site, a change in a number of factors and variables is triggered, such as soil conditions, weather conditions, the type and condition of adjoining properties, the type of the people involved, their language and culture, and many other facets of a construction project or related to it.

¹³ Adjudication under the Housing Grants, Construction and Regeneration Act 1996 which came into force on 1 May 1998.

¹⁴ For a more detailed discussion of these circumstances which excuse the contractor from completing the contract, see *The FIDIC Form of Contract - The Fourth Edition of the Red Book*, by Nael G Bunni, Blackwell Science Ltd., Oxford, 2nd Edition, 1997, Chapter 13.

- The time required to plan, investigate, design, construct and complete a construction project spans such a lengthy period which is often greater than the period of cyclical recurrence of many of the natural hazards to which such projects are exposed. This is known in statistical terms as the 'return period'. Whilst the effect of such natural hazards as earthquake, flood, storm, etc., is insurable, the insurance cover does not extend to time loss and in the case of 'Force Majeure' the contract may be determined. Furthermore, if a reduction in the period of construction is sought, a new matrix of risks is introduced.¹⁵
- Typically, construction programmes are complex involving hundreds, if not thousands, of construction activities most of which have been priced by the contractor at the lowest possible level, in order to win the contract. In general terms, to complete an activity three types of resources will be needed: manpower, materials and equipment. Reduction or miscalculation of any one of these resources will cause delay or disruption in the planned programme, two effects which lead to different results in terms of loss and compensation. Furthermore, these activities interact with each other in such a way that in some cases an activity cannot start until another is completed, in full or in part. Any delays in such critical activities will cause all dependent activities to suffer similar delay and can sometimes compound the delay. With the advancement of computer technology, complex methods of planning and analysis of construction programmes have been developed to help manage a project so that it is completed on time and within budget. The most frequently used, and best known technique, is Critical Path Network analysis (CPN). Whilst this technique is a remarkable tool if used properly, it can easily be mishandled by the uninitiated, especially if carried out in retrospect. This characteristic of construction projects has resulted in the use of highly qualified technical experts to prepare, evaluate and assess claims resulting from delay and disruption, which make up some of the most expensive claims in the industry.
- Construction projects are susceptible to risk cultivation by the parties involved, or by others associated with them, or advising them. The objectives of risk cultivation serve to enhance the position of the party involved in such tactics.
- The personnel required to initiate, visualise, plan, finance, design, supply materials and plant, construct, administer, supervise, commission and repair any defects in a construction project is enormous. Such people usually come from different social classes and, in international contracts, from different countries and cultures with different languages. Those who are involved in international contracts readily appreciate the immense problems that result from technical translation from one language to another.
- The personnel involved come from numerous firms. Extensive interaction is required between many of the firms involved in construction, including those engaged as suppliers, manufacturers, sub-contractors and contractors, each

¹⁵ Nael G Bunni, *Construction Insurance*, Elsevier Applied Science Publishers, London, 1986, page 143.

with its own commitments and goals. These commitments and goals are not always compatible with each other, hence resulting in conflict.

- A single cause of conflict in a construction project may affect a chain of contracts between a number of parties joined in different contracts and subcontracts, each of which has its own arbitration clause. This single cause may, therefore, result in a number of disputes between a number of the parties, all involved in the same project.¹⁶ For example, a collapse might be due to either defective material or design or workmanship or manufacture with the employer, the engineer, the contractor, the subcontractor and the manufacturer of a constituent element, each accusing the other(s) and attempting to off-load the responsibility, the resultant liability, and the blame for the fault. The most appropriate method of resolving such disputes is by consolidating all of them into a single multi-party arbitration. However, this is easier said than done, as no one has yet come up with a satisfactory mechanism for such a multi-party procedure.
- Many construction projects are located in isolated regions with difficult terrain, sometimes stretching over extensive areas, exposed to natural hazards of unpredictable intensity, frequency and return period.
- The construction industry is a fast-developing and innovative industry. The materials selected for use generally include a number of new products of unproven performance or strength. Whilst advanced and complex technology is not only desired, but also necessary in some construction projects, the result in most cases is a higher risk.

Some of these innovations have evolved in the method or the process of dispute resolution selected in the standard forms of contract. So, for example, as explained above, amicable dispute resolution and DAB procedures have been added to the traditional method of dispute resolution, resulting in a reduction in the number of disputes proceeding to arbitration. However, this means that the disputes continuing to arbitration are the complex and intricate disputes, which require real skill from the arbitrator. It could also mean that these complex disputes do not surface until the end of the project.¹⁷ Furthermore, the multiplicity of the steps in the dispute resolution process has resulted in a number of complications peculiar to construction disputes, for example the question of calculating the period that applies to interest on money awarded in the arbitration. Figures 2 and 3 show the possible starting points for such calculation in construction contracts as opposed to another type of contract, such as, for example, a contract for sale.

As in other commercial activities, conflict arises in construction out of issues relating to both fact and law. However, the nature of the issues that arise from

¹⁶ For example, but at one end of the spectrum, the Boston Central Artery Tunnel, a project under construction in the United States at the present time, involving more than 120 separate construction packages. Its construction is expected to span 14 years.

¹⁷ A recent article in *The Dispute Review Board Foundation Forum*, Volume 4, Issue 1 on the Boston Central Artery Tunnel shows that whilst only 22 disputes have been formally presented to the project's DRBs during the past nine years, there is a backlog growth of 500 claims in the past year.

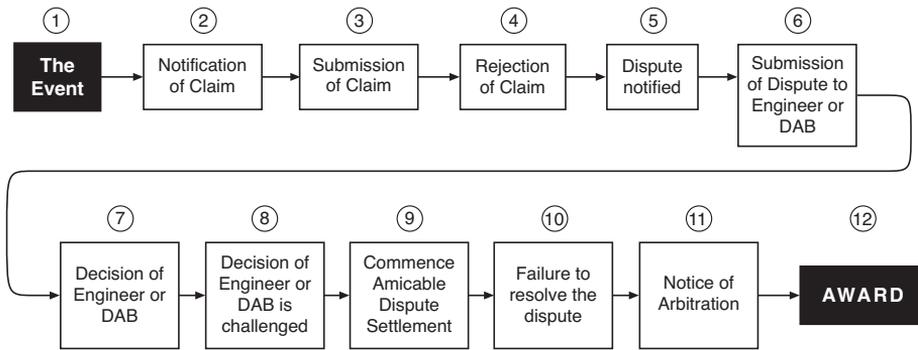


Figure 2: Relevant target dates in a typical construction contract for the calculation of interest.

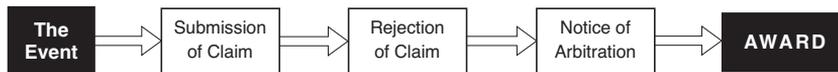


Figure 3: Relevant target dates in a typical contract for the calculation of interest

construction contracts is distinguishable in a number of ways. Firstly, in general terms, they are founded, more often than not, on matters of fact. Secondly, in construction, the factual issues can be, and usually are, multi-faceted. Radiating from the actual occurrence which gives rise to loss, damage or injury, referred to in construction terms as the ‘event’, to other aspects including technical, financial, measurement and consequential issues, all of which must be addressed and must be established or proven. Thirdly, issues of law in construction contracts can be divided into two parts: those that relate to the general principles of the applicable law of the contract between the parties, and others that relate to the standard conditions of contract used, as explained in the following paragraph. These three distinguishing factors lead, in almost all construction arbitration cases, to the introduction of massive documentation supported by a large number of witnesses of fact and expertise.

An important characteristic in nearly all construction projects is the use of standard forms of contract, which superimpose specific legal principles onto the applicable law of contract. They have developed into a specialised area of law and have crossed national frontiers to form an international legal code agreed by the parties. They have in fact been very successful in coping with any conflict of laws, which may exist between the various legal systems involved.¹⁸ Experience has shown

¹⁸ There is a general call for a ‘Construction Lex Mercatoria’ by a number of eminent lawyers and construction professionals as may be seen, for example, from the article “Moving Toward a Construction Lex Mercatoria: A Lex Constructionis”, by Charles Molineaux, *Journal of International Arbitration*, 1997.

that a significant number of disputes in the construction field arise from the application and interpretation of these special standard conditions of contract. Therefore, it is essential to appreciate that there is, in construction, an additional area of law to be mastered, which is continuously evolving and being refined to meet the particular type of project envisaged by the owner, or promoter, and his advisory team.¹⁹

International Construction Disputology and Arbitration

Because of the above unique and peculiar inherent characteristics of construction contracts, the development in the science and art of disputology for the whole spectrum of construction activities was inevitable. If it were to be successful, the resolution of the complex and extensive construction disputes had to strive to be at the forefront of advanced techniques in dispute resolution. Therefore, although arbitration remains as the final step in dispute settlement, the path towards that step now includes two other successful procedures, the Dispute Adjudication Board and Amicable settlement, the latter mostly in the form of Mediation or Conciliation.

The growth in the Dispute Adjudication Board or Dispute Review Board procedure can be seen from figures recently published in *Foundation Forum*.²⁰ These are tabulated in Table 1. As mentioned earlier, the Dispute Adjudication Board is used in the procedure adopted by FIDIC and the Dispute Review Board is used in the procedure incorporated by the World Bank in their Standard Bidding Documents. They differ in their detail, including their respective timetables, but with one important exception are similar in principle, the exception being the temporary binding nature of the decision of the DAB, as against the totally non-binding effect of the recommendation of the DRB.

It is worth mentioning at this point that there are a number of similarities between the procedure under the DRB, DAB, adjudication under FIDIC's Green Book and adjudication under the Housing Grants, Construction and Regeneration Act 1996 which came into force in the United Kingdom on 1st May 1998.²¹ The latter would be particularly relevant to international contractors where the works are carried out within the United Kingdom, even though the applicable law of the contract is from a different jurisdiction. The relevant section of the Act to the rights of the parties and the procedure to be followed is section 108, which gives any party to a construction contract the right to refer a dispute arising under it for adjudication.

¹⁹ Foremost amongst these standard forms of contract are those published by FIDIC since 1957. Recently, in September 1999, FIDIC published new forms, which cover the whole spectrum of the construction industry and are expected to be used alongside those already in existence. Therefore, this area of the law will become even more extensive than it is at the present.

²⁰ *The Dispute Review Board Foundation Forum*, Volume 6, Issue 1, January 2002.

²¹ The definition of a construction contract under the Act is wide and includes an agreement to carry out architectural, design and surveying work and to provide advice on building, engineering, interior and exterior decoration and landscaping work. By Section 106 it does not include a contract with a residential occupier, so that a contract with a building owner for works to premises that he occupies or intends to occupy as his residence will not be affected, although any sub-contract under such a contract will be.

Year	Projects with DRBs	Contract Value US\$billion	Disputes settled
1988	19	1.4	16
1989			
1990			
1991	63	3.2	78
1992			
1993			
1994	166	9.7	211
1995			
1996			
1997	326	22.1	424
1998	477	28.8	596
1999	576	32.6	758
2000	666	35.4	869
2001	818	41.0	1021

Table 1: Contracts complete and under construction

The procedure for adjudication must comply with that section, which lays down clearly-identified certain minimum provisions. If the adjudication provisions in any construction contract do not comply with these requirements, the Scheme for Construction Contracts produced by legislation will apply, referred to as ‘the Scheme’.

Moving on to arbitration, one of the developments at the forefront of advanced techniques in dispute resolution was the introduction of case management in the arbitral process by experienced arbitrators in the field of construction.²² One commentator expressed the need for management in this way: as in commercial transactions, no businessman would dare attend a meeting without having ‘done his/her homework’ so it is usual that anyone in this situation would have obtained background papers and would have familiarised him/herself with the business in hand. He concluded that it must follow that prior to any hearing or meeting, full documents are expected to be supplied.²³ Thus, case management involves the introduction of a number of procedural steps, as appropriate, in order to give effect to the desired outcome of proper preparation and, in turn, speed and economy. It includes, amongst others, the following:²⁴

²² See “Construction Disputes on the Eve of the New Millennium” published in *Arbitration*, Vol. 65, No. 4, November 1999.

²³ “Two Contributions to Debate”, a contribution by Brian R Simmons, *Arbitration*, Vol. 65, No. 2, May 1999.

²⁴ Nael G Bunni, *The FIDIC Form of Contract - The Fourth Edition of the Red Book*, Blackwell Science Ltd., Oxford, 2nd Edition, 1997, Chapter 19 and in particular page 417 include most of these proposals.

- Holding case management conferences at the commencement of an arbitration and at other specified stages of the case in order to plan and to monitor time and cost.
- Identifying and separating the issues into categories and dealing with predominant issues before others in the hope of promoting settlement prior to the main hearing.
- Confining the evidence to the issues.
- Arranging for full written submissions covering both fact and law from both parties, supported by all documents relied upon, properly referenced. Such submissions would have three benefits:
 - to impel the parties to have their case properly structured before coming to the hearing;
 - to enable the parties to know each other's case before they get to the hearing, so that there are no surprises and the strength or weakness of a case can be evaluated before it is tested in full forum; and
 - to enable the tribunal to understand the parties' cases and focus the attention during the hearing solely on the relevant areas.
- The submission in writing and exchange of all witness statements and experts' reports in advance of any hearing, supported by documents relied upon. This is a particularly important feature of cost-effective management since in the words of an eminent author "(W)itness statements have a dual role:
 - they require each party to disclose his full evidence, so that his opponent is not taken by surprise. This is conducive to settlement and to enabling the parties to prepare to address the real issues;
 - they are intended (unless justice otherwise requires) to stand as evidence in chief and accordingly save the time and cost of an examination in chief".²⁵
- Controlling the number of experts on the issues concerned, the time available for cross-examination and giving consideration as to whether experts ought to:
 - be examined by the experts of the other party or by the tribunal; and/or
 - have joint meetings with arbitrator or, in the case of a tribunal, with the chairman, without the presence of lawyers or at least if they were to be present, then only as observers. This procedure would obviously be more successful when the sole arbitrator or the chairman is an expert in the field of the dispute. However, this procedure could also be entrusted to the whole tribunal when one of the co-arbitrators is an expert in the issues discussed.

²⁵ "Civil Litigation in the 21st Century", The Chancery Bar Association Spring Lecture 1998, by the Hon Mr Justice Lightman in Lincoln's Inn on 3rd June 1998, published in *Arbitration*, Vol. 65, No. 1, February 1999.

- Ensuring that experts know that in giving evidence to the tribunal, they owe their primary duty to the tribunal and not the parties and that their evidence should be an objective, unbiased opinion of matters within their expertise.
- Applying a limited timetable to oral hearings with equal sharing of time between the parties, provided that such limitation does not offend the rules of natural justice, which require each party to be given a reasonable opportunity to present evidence and argument and to test the case against him. It is suggested, however, that as expressed by a prominent lawyer arbitrator, ‘reasonable opportunity’ should be considered in the following terms: “But there is no right to conduct endless and exhaustive examination of witnesses, and there is considerable scope for an arbitrator to adopt a firm approach in determining how far the investigation of particular issues should be taken. In this regard, the arbitrator may need to expressly address the question of what is ‘reasonable opportunity’, and if necessary hear the parties on the question. It is most unlikely that the court would seek to impose any different view.”²⁶
- In preparation for the hearings, the production of a joint and agreed bundle of documents, chronologically paginated, and in complex and large disputes, a much smaller core bundle.
- At the hearing, taking written statements as evidence in chief and proceeding directly to cross examination, in between short opening and closing statements from both parties, which would then be supplemented by written post-hearing submissions.
- Contemplating what, if any, other specific requirement peculiar to the particular project or dispute exist as these may vary widely.

It is suggested, that in devising his management framework, the arbitrator should be aware of the underlying forces which exist in the particular circumstances of the case and consider, amongst others, the following questions or matters:

- Is the virtue of speed of dispute resolution an aspiration of all the parties involved? With conflicting objectives, even the procedure becomes a disputed matter. As discussed above, there are many other examples that make construction arbitration such a complex topic to deal with.
- Have the parties placed a cost restraint on their lawyers?
- Would party autonomy affect the influence, which the parties’ legal representatives could have on the arbitration procedure to be adopted?
- Are the expert witnesses employed by the parties independent? Some expert witnesses perform their role without paying any attention to the fact that “their evidence should be, and should be seen to be, the independent product of the

²⁶ “Cost-effective arbitration”, by John Uff QC, *Arbitration*, Vol. 59, No. 1, February 1993, page 33.

expert, uninfluenced as to form and content by the exigencies of litigation. To the extent that it is not, the evidence is likely to be not only incorrect, but self defeating.”²⁷

Some legal representatives, presumably to impress their clients, adopt, at their client’s expense, aggressive and perverse attitudes, often in a hostile manner and, in particular, in the form of feverish correspondence accompanied by compulsive use of the photocopying machine.²⁸

Methods of Dispute Settlement under the FIDIC Forms

A summary of the position regarding the methods of dispute settlement under the various FIDIC Forms of Contract is set out in Table 2.

Concluding Remarks: what will the future hold?

Although arbitration remains the ultimate method of dispute settlement in international construction contracts, two additional methods have been introduced before arbitration can be initiated. The first method is through the appointment of a Dispute Adjudication Board and the second is by Amicable Dispute Settlement. These are mandatory methods and whilst they are expected to reduce the number of references to arbitration there will be no alternative to arbitration for many complex and intriguing disputes. This is mainly due to the adoption of the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards, ratified by over one hundred and twenty jurisdictions worldwide.

Construction contracts produce a second layer of legal principles through their standard forms of contract, which are superimposed on the applicable law of the contract between the parties involved. These conditions have developed into a specialised area of the law and have crossed national frontiers to form an international legal code for construction activities. They have been very successful in coping with any conflict of laws, which may have existed between the various legal systems involved. The effect of these standard forms of contract is the recent call for a ‘Construction Lex Mercatoria’ by a number of eminent lawyers and construction professionals.

It will be difficult and unhelpful for anyone to be involved in the resolution of disputes arising from such construction contracts unless he or she is very familiar, if not expert, in the areas of these forms and the disputology incorporated in them.

Thus, international construction disputes reaching the arbitration stage will require even more highly skilled arbitrators than before, educated in the field of the

²⁷ *Whitehouse v. Jordan* [1981] 1 All ER 267, 276B, per Lord Wilberforce.

²⁸ In England, in a recent judgment of the Court of Appeal in *Vernon v. Bosley* [1997] 3WLR 683 the duty of the advocate to the court was extended to include doing all in his power to facilitate the economic and expeditious administration of justice.

Form of Contract	Engineer's Decision	Adjudication	Amicable Settlement	Arbitration	Rules of Arbitration
Red, 4th Ed., 1987-1992.	Yes, given within 84 days ¹	No	Yes, starting within 70 days ²	Yes, starting within 56 days ³	ICC
Red, 4th Ed. & Supplmt. 1996.	No	DAB to decide within 84 days	Yes, within 28 days ⁴	Yes, within 56 days ⁵	ICC
Yellow, 3rd Ed., 1987-1988.	Yes, within 28 days of notice of dissatisfaction	No	No	Yes, within 56 days of Engineer's Decision	ICC
Orange, 1st Ed., 1995.	No Engineer	DAB to decide within 56 days	Yes, within 28 days ⁴	Yes, within 56 days ⁵	As named in the Appendix
New Red, 1st Ed., 1999.	No	DAB to decide within 84 days	Yes, within 28 days ⁴	Yes, within 56 days ⁵	ICC
New Yellow, 1st Ed., 1999.	No	DAB to decide within 84 days	Yes, within 28 days ⁴	Yes, within 56 days ⁵	ICC
Silver, 1st Ed. 1st Ed., 1999.	No Engineer	DAB to decide within 84 days	Yes, within 28 days ⁴	Yes, within 56 days ⁵	ICC
Green, 1st Ed. 1st Ed., 1999.	No Engineer	Yes, by special Rules	No	Yes, within 28 days	As named in the Appendix
White, 3rd Ed., 3rd Ed., 1998.	Not Applicable	No	Yes ⁶	Yes	As named in the Particular Cond.

1 Engineer's Decision must be given within 84 days after receipt of the Reference to him under Clause 67.

2 Within 70 days of the Engineer's decision, a dissatisfied party must give Notice of intention to commence arbitration.

3 Within 56 days of the Notice of intention to commence arbitration, the Parties shall attempt to settle the dispute amicably.

4 Within 28 days after receipt of the Decision of the DAB, either party may notify the other of its dissatisfaction of that Decision. No arbitration can commence without this Notice.

5 Within the next 56 days, the Parties shall attempt Amicable Settlement.

6 The Parties should attempt Negotiation in Good Faith. Failing settlement in 14 days, then dispute to be resolved by their designated representatives. Failing settlement in 14 days, then amicable settlement through mediation (a procedure of appointment of mediator and for the process itself is set out in the Agreement). Mediator has 28 days from the date of appointment to settle the dispute.

Table 2: Methods of dispute settlement under the various FIDIC Forms of Contract

peculiar inherent characteristics of construction disputology and trained to manage the arbitral process effectively in all aspects, but particularly in respect of time and cost without sacrificing fairness and justice.

To be able to deal with dispute resolution effectively, one must understand the principles that lie behind such dispute resolution mechanisms and be familiar, not only with their operation, but also with their objectives and their limitations.

The development of specially-designed arbitration guidelines and rules for international construction arbitration would be of enormous value in this field, a task which has already begun and some results can be expected in the immediate future.²⁹

It is not beyond expectation that 'Disputology' could become a recognised topic for the art and science of dispute resolution. One can also foresee the possibility of the establishment of a new International Court for resolving disputes on the enforceability and/or challenge of arbitral awards promoted through a convention similar to the 1958 New York Convention. Such a court would remove some of the unhappy experiences in construction arbitrations.³⁰

²⁹ There are a number of initiatives aiming to produce a special set of guidelines for the construction industry. In France, the International Chamber of Commerce has established a working group to investigate the adaptation of their rules to specific areas of dispute including construction. In England, rules along the lines of The Construction Industry Model Arbitration Rules, 'CIMAR', or the ICE Arbitration Procedure, but for international construction, are awaited.

³⁰ "Concord and Conflict in International Arbitration", The Keating Lecture in memory of Donald Keating, by the Rt Hon Sir Michael Kerr, Kings College, London, 1996, page 29.

Resolving Contract Disputes: International Commercial Arbitration and International Conciliation

David Williams QC

The Growth of International Commercial Arbitration

Over the past 30 years, international commercial arbitration has been transformed and institutionalised as the primary method for the resolution of transnational commercial disputes, including construction.¹

The ascendancy of arbitration over national court litigation can be seen in the way that high profile international construction disputes have increasingly been submitted by agreement of the parties to international arbitral panels. Under the principle of party autonomy, National Courts have strongly supported this choice and refused to let any party later change its mind and go to the Courts for substantive relief: for a leading example in the construction field, see *Channel Tunnel Group v Balfour Beatty Construction Ltd* [1993] AC 334; [1993] 1 ALL ER 664.

The prevalence of international arbitration is also evident in the tremendous growth since the late 1970s in the number of international arbitration centres and the gradual acceptance of uniform procedural arbitration laws in many countries, based on the UNCITRAL Model Law. International commercial arbitration therefore represents an international dispute resolution device of immense practical importance.²

Reasons for Choosing Arbitration for International Commercial Disputes including Construction Industry Disputes

When businesses enter into transnational relationships, such as contracts for the sale of goods, joint ventures, construction projects, or distributorships, they must determine whether arbitration, or litigation before national courts, is the most appropriate means of resolving any disputes. Typically the contract will call for arbitration in the event of any dispute. Several reasons lie behind this choice.

Neutrality / Certainty

An agreement to arbitrate is a forum selection agreement that avoids problems of jurisdiction. Without a forum selection agreement, a dispute between parties

¹ For further discussion see: Dezalay and Garth, "Merchants of Law as Moral Entrepreneurs: Constructing International Justice from the Competition for Transnational Business" (1995) 29 *Law and Society Review* 27 and Wetter, "The Internationalisation of International Arbitration: Looking Ahead to the Next Ten Years" (1995) 11 *Arbitration International* 117.

² For further discussion see generally Lowenfeld, *International Litigation and Arbitration*, (1993) pp 331-367.

from different countries involves the unattractive prospect of the aggrieved party having to litigate in the Courts where the other party is established. Even if the aggrieved party decides to litigate in the Courts in its own country there is always the potential for the defendant to dispute jurisdiction. A national court may decline to hear a case if it finds, among other things, that it lacks subject matter or personal jurisdiction, that it is not a convenient forum, or that hearing the case would contravene the doctrines of sovereign immunity or act of state.

However, even if the arbitration is to be held in the country where one party is established, an agreement to arbitrate is an agreement on a neutral forum, not tied to the judicial or political structure of either party. This is perhaps the main reason given today for choice of arbitration in the international sphere. It allows each party to avoid being forced to submit their dispute to the Courts of the other. Moreover, under most modern national arbitration laws, the extent of judicial intervention in the arbitral process will be minimal.

Indeed, with the International Centre for the Settlement of Investment Disputes (ICSID) arbitration system established under the 1965 Washington Convention under the auspices of the World Bank, this separation between the arbitration system and state courts is almost complete.

As noted below, ICSID is a supranational arbitration system driven by the need to encourage investors to invest in developing countries and remove for them concerns about litigation against the contracting state in the Courts of the host State. Even semi-administered arbitration, such as that of the International Chamber of Commerce (ICC) in Paris, seeks to minimise the level of interference in the arbitral process. The ICC exclusion of appeals provision, upheld in the New Zealand case of *CBI NZ Ltd v Badger Chiyoda*, [1989] 2 NZLR 669 (discussed below), is a prime example.

Enforceability of Arbitral Awards

As a result of the 1958 New York Convention on the Recognition and Enforcement of Arbitral Awards ('the New York Convention'), arbitral awards are easy to enforce — much easier worldwide than judgments of Courts. The New York Convention makes arbitral awards rendered in Convention States, of which there are well over 100, enforceable in all other Convention States on the same basis as domestic arbitral awards, subject to very limited defences. There is no worldwide treaty network for enforcement of Court judgments comparable to the New York Convention with respect to arbitral awards, although The Hague Conference on Private International Law is currently preparing a draft Convention on International Jurisdiction and Foreign Judgments. Whether this effort will come to anything remains to be seen.

Waiver of Sovereign Immunity

Private parties have become increasingly conscious of the special problems of litigating against governments. Provision in an agreement with a State entity to

arbitrate future disputes avoids the problems of sovereign immunity. An agreement on commercial arbitration is a waiver of sovereign immunity.³

Confidentiality

In arbitration, unlike litigation, both the proceedings and the award generally remain confidential, thus protecting sensitive or proprietary information from disclosure and thereby facilitating settlement. However, parties to an international arbitration agreement should not assume that their arbitration will automatically remain confidential. There are two reasons for this reservation. First, the laws of some countries do not provide for confidentiality of arbitral evidence (for the Australian position see *Esso Australia Resources Ltd v Plowman* (1995) 128 ALR 391, noted by Williams & Thorp [1996] *NZ Law Review* 101). Secondly, not all international arbitration rules expressly provide for confidentiality. Thirdly, the few national laws which deal with confidentiality, e.g. s 14 of the New Zealand Arbitration Act 1996, limit confidential treatment to the deliberations of the tribunal and/or to the arbitral award.

Specialised Competence

A national judge may lack expertise in the particular subject matter of the dispute or in international commerce generally. In arbitration, the parties may choose arbitrators with expertise in particular areas or international matters, thereby saving time and maximising the prospect of an acceptable decision.

Procedural Flexibility

National court procedures are fixed by local rules, and may include time-consuming procedures — most notably, pre-trial discovery — which may be unnecessary or inappropriate for the resolution of particular disputes. The procedure in arbitration, including the amount of discovery, organisation of hearings and submission of evidence and arguments, is left largely to the agreement of the parties and discretion of the arbitrators, provided that a relatively relaxed standard of due process is met.

Speed

Arbitration is usually quicker than litigation especially in comparison with the crowded court calendars in all the world's major commercial centres. A complex commercial arbitration will usually be resolved in two to three years.

Cost

Arbitration is not necessarily cheaper than litigation as the parties must pay the fees and expenses of the arbitrators (and of the administering arbitral institution), as well as hire rooms for meetings and hearings.

³ See Delaume, "Judicial Decisions Related to Sovereign Immunity and Transnational Arbitration" (1987) *Foreign Investment Law Journal* 403.

Ad Hoc versus Institutional Arbitration

International construction arbitration can be either ‘institutional’ or ‘ad hoc’. Institutional arbitration is arbitration conducted in accordance with the procedural rules of a particular arbitral institution, the most well-known of which are the International Chamber of Commerce, Paris (ICC), the American Arbitration Association (AAA) and the London Court of International Arbitration (LCIA). In the Asia-Pacific region, the Hong Kong International Arbitration Centre, the Singapore International Arbitration Centre and the China International Economic and Trade Arbitration Commission (CIETAC) provide similar services. Typically, these institutions assist the parties in the constitution of the arbitral tribunal, supervise (to varying extents) the application of the institution’s arbitration procedures, determine the arbitrators’ fees and charge administrative fees for their services. The institutions themselves do not adjudicate the merits of the parties’ dispute, leaving that task to the arbitrators appointed in each case.

Ad hoc arbitration is not conducted under the auspices of an arbitral institution. Instead, parties simply select arbitrators to resolve their disputes without institutional intervention. The parties may either draw up their own rules of procedure, select a pre-existing set of arbitration rules — the most prominent of which are those promulgated by the United Nations Commission on International Trade Law (the ‘UNCITRAL rules’) — or allow the arbitrators to independently formulate procedural rules.

The primary factors to be considered when deciding between institutional and ad hoc arbitration include:

- **Predictability versus Flexibility.** Both institutional rules and the UNCITRAL Rules are time- and practice-tested rules, which provide for many of the procedural issues likely to arise during arbitration. Drafting special ad hoc rules, by contrast, is an expensive and time-consuming process, which can lead to unpredictable results. On the other hand, special ad hoc rules may be appropriate to meet the particular wishes of the parties and circumstances of the case.
- **Procedural Matters.** In institutional arbitration, the institution is available to provide assistance in resolving procedural difficulties, especially with respect to the constitution of the tribunal, which may arise during the course of the proceedings. In ad hoc arbitration, by contrast, the parties’ only recourse other than to the arbitral tribunal (if it has been constituted and if it is willing to resolve the difficulty) is to the national courts at the place of arbitration, in which event certain benefits of arbitration (such as confidentiality) may be lost.
- **Administrative Matters.** In institutional arbitration, the institution will determine certain administrative matters (such as the fees and expenses of arbitrators and enforcement of time-limits) that might otherwise be quite awkward for the parties to resolve with the arbitrators. In ad hoc arbitration, those matters will have to be handled by the arbitrators and the parties.

- **Institutional Stature.** In institutional arbitration, the institution lends its standing to the arbitrators' procedural rulings (including the decision to proceed notwithstanding default by a party) and award, enhancing the likelihood of voluntary compliance with or judicial enforcement of both. Ad hoc arbitration, by contrast, depends largely for its effectiveness on co-operation between the parties, backed up by an adequate legal system in the place of arbitration.
- **Cost.** Institutional arbitration is often believed to be more expensive than ad hoc arbitration, especially where the amounts at issue are large and the arbitrators' fees and institution's administrative expenses are calculated as a percentage of the amounts in dispute. The calculation of arbitrators' fees and administrative expenses on such an ad valorem basis, however, frequently results in lower arbitrators' fees than those calculated on the basis of time spent and tends to discourage parties from asserting inflated claims for damages.
- **Delay.** Delay inevitably results from the need to process certain steps in the arbitral proceedings through the bureaucratic machinery of the arbitral institution. In ad hoc arbitration, on the other hand, delay may result from the absence of an institutional mechanism to resolve procedural difficulties, especially those that arise before the constitution of the arbitral tribunal.

Many experienced international practitioners find that the balance of factors favours institutional over ad hoc arbitration, primarily because institutional arbitration provides added predictability and security, and reduces the prospects for resort to national courts as to procedural matters. Ad hoc arbitration pursuant to the UNCITRAL Rules is, however, becoming increasingly popular, and may be especially attractive where the amounts at stake are high and the parties and their counsel are sufficiently experienced in international arbitration to forego the services and added security provided by arbitral institutions.

Distinguishing Features of the Main Institutional Rules

The ICC Rules: 'Supervised' Arbitration

The ICC Rules were promulgated by the International Chamber of Commerce in furtherance of its purpose to promote international commerce worldwide. Users of ICC arbitration have recourse to it either by a special agreement submitting specific issues to arbitration or by an arbitration clause in a contract. Hence ICC arbitration flows from private law agreements. Its utility depends on support and enforcement by national laws, especially statutes enacting the New York Convention of 1958.⁴

Under the ICC Rules, the ICC's International Court of Arbitration (the 'ICC Court', an assembly of over 50 prominent figures in international arbitration) appoints the

⁴ For further discussion see generally, Craig, Park & Paulsson, *International Chamber of Commerce Arbitration* (ICC Publishing Inc, 3rd ed 2000, Craig, "International Arbitration and National Restraints in Arbitration" (1958) 1 *Arbitration International* 49 and the judgments in *Bank Mellat v Helliniki Techniki SA* [1984] QB 291.

arbitral tribunal, usually consisting of two party-nominated arbitrators and a chairperson, and supervises the tribunal's subsequent conduct of the arbitral proceedings. For instance it advises on the terms of reference which define the issues to be arbitrated, hears applications for replacement of arbitrators on the grounds of prejudice, bias, incompetence or non-performance, and scrutinises awards with a view to assuring their enforceability.

Three features in particular distinguish ICC arbitration from other forms of institutional arbitration. First, the ICC Court does not directly appoint the chairperson or sole arbitrator of the tribunal, but instead requests the appropriate National Committee (determined in light of the place of arbitration, the governing law and other factors) to propose an arbitrator for the ICC Court's confirmation, thereby tapping into a large international pool of experienced arbitrators. Second, the arbitral tribunal's first duty under the ICC Rules is to compose a document defining its terms of reference, from which it may deviate during the ensuing proceedings only by means of a rider signed by both parties. Finally, an ICC tribunal must submit its award in draft form to the ICC Court which may require the tribunal to make changes in the form of the award designed to enhance its enforceability and make suggestions to the tribunal as to the substance of the award.

ICC arbitration remains the most widely-used form of international arbitration. It is initiated by a request for arbitration in which the claimant identifies itself and provides information on the dispute, the relief sought and any relevant agreement it may have made on arbitration. In 2000, 541 requests for arbitration were registered by the ICC Court, representing an increase of 2% on the previous year. This brought the number of cases in progress at the end of the year to over 1,000 and the total number of cases handled in the history of ICC arbitration to 11,362. However, its salient features are subject to occasional debate as to their relative benefits and drawbacks. It is fair to say, however, that the international stature of the ICC coupled with the degree of supervision exercised by the ICC Court accord special credibility, and hence enhanced enforceability, to awards rendered under the ICC Rules. In cases involving a state or state enterprise, which comprise a significant portion of the ICC Court's caseload, that stature and supervision may be particularly important to the enforceability of the awards rendered.

The LCIA and AAA Rules: 'Administered' Arbitration

The LCIA Arbitration Rules 1998, the AAA's International Arbitration Rules 1997 and the SIAC, HKIAC, and CIETAC rules are excellent examples of institutional arbitration rules. Under these sets of rules, the institutions' primary roles are in the constitution of the tribunal (and determination of challenges to arbitrators), after which the arbitral proceedings are treated in greater detail than in the ICC Rules, but with significantly less intervention by the institutions.

The UNCITRAL Rules: Ad Hoc Arbitration

The UNCITRAL Rules were developed in 1976 by the United Nations Commission

for International Trade Law. It should be noted that the UNCITRAL Rules are distinct from the UNCITRAL Model Law, although the Model Law was partially based on the Rules. The Rules have become increasingly popular due largely to their good track record as the basis for the rules used by the Iran-United States Claims Tribunal. In substance, the UNCITRAL Rules are quite similar to the LCIA and AAA Rules (both of which were patterned to some extent on the UNCITRAL Rules), although parties to an UNCITRAL arbitration agreement should choose an appointing authority to perform the principal functions otherwise performed by the administering institution. Several arbitral institutions, including the ICC are available to serve as appointing authority under the UNCITRAL Rules.⁵

New Zealand Cases

Although New Zealand is a small country, it has become involved in the advancement of international commercial arbitration. First, in its Arbitration Act 1996, which introduces into New Zealand law the UNCITRAL Model Law for international commercial arbitration. Secondly, in its case law, as evidenced in *Attorney General v Mobil Oil NZ Ltd* [1989] 2 NZLR 649 and *CBI NZ Ltd v Badger Chiyoda* [1989] 2 NZLR 669. Both cases arose out of industrial construction projects and represent a vindication of the concept of party autonomy which has become central to the advancement of arbitration as a dispute resolution process both domestically and internationally. In *Coppee-Lavalin SA/NV v Ken-REN Chemicals and Fertilisers Ltd (In liq)* [1994] 2 All ER 449, Lord Mustill recently stated the principle as follows (at 458):

“... ‘party autonomy’ ... emphasises that arbitration is a consensual process, and that national courts should within very broad limits recognise and give effect to any agreement between the parties, express or tacit, as to the way in which the arbitration should be conducted. This is now widely recognised as a first principle of arbitration law, and the English Courts in common with those of other nations with developed systems of arbitration law strive to give effect to it.”

Attorney General v Mobil Oil NZ Ltd

The background to this case was that in 1979 the New Zealand Legislature enacted the Arbitration (International Investment Disputes) Act. It implemented in domestic law the 1965 Washington Convention on the Settlement of Investment Disputes between States and Nationals of Other States (ICSID), to which the Government of New Zealand had become a party.

In 1982, the New Zealand Government concluded contracts with the Mobil Oil

⁵ For further discussion on the experience of the Iran-United States Claims Tribunal with the UNCITRAL Rules, see Baker and Davis, *The UNCITRAL Arbitration Rules in Practice: The Experience of the Iran-United States Claims Tribunal* (Kluwer, 1992) and van Hof, *Commentary on the UNCITRAL Arbitration Rule: The Application by the Iran-United States Claims Tribunal* (Kluwer, 1991).

Corporation and several of its subsidiaries, relating to the Motonui Synfuels project for the conversion of natural gas into synthetic gasoline. The parties entered into a participation agreement which included a provision that created in favour of one of Mobil's local subsidiaries certain preferential off-take rights to the synthetic gasoline. Pursuant to article VII of the Agreement, the parties agreed any dispute under the Agreement was to be submitted for resolution to arbitration under the auspices of ICSID.

In May 1986, the Commerce Act 1986 was enacted, the object of which was to promote competition in markets within New Zealand. The Act prohibited, with retroactive effect, contracts, arrangements or understandings which substantially lessen competition. At the end of 1986, the Crown wrote to Mobil informing it the off-take rights provision was considered to contravene the Commerce Act and that consequently the Crown would not give effect to the clause from 1 March 1987, the date on which the relevant Commerce Act provisions were to come into force. After several attempts to resolve the resultant dispute had failed, Mobil and two of its subsidiaries submitted to ICSID a request for arbitration which was registered by the Secretary-General of ICSID on 15 April 1987.

The Crown objected to the jurisdiction of ICSID and, in May 1987, commenced interim injunction proceedings in the High Court to restrain Mobil from referring the dispute to ICSID or from continuing with any such reference. The Crown contended that the issue as to whether the clause in the Participation Agreement contravened the provisions of the Commerce Act should be decided in the Courts of New Zealand. Mobil filed an application for stay of proceedings in the High Court of New Zealand on the basis of s 8(1) of the 1979 Act which provides:

“If any party to proceedings pursuant to the Convention (or any person claiming through or under him) commences any legal proceedings in any Court against any other party to the proceedings pursuant to the Convention (or any person claiming through or under him) in respect of any matter to which the proceedings pursuant to the Convention relate, any party to the legal proceedings; and the Court may, if satisfied that there is no sufficient reason why the matter should not be dealt with under the Convention, make an order staying the legal proceedings.”

Heron J found that the requirements of the Act were met and ordered a stay of all proceedings before the High Court until the Arbitral Tribunal, to be constituted according to ICSID Rules and Regulations, had determined its jurisdiction. Subsequently the Crown elected not to appeal and eventually formally accepted the jurisdiction of the ICSID Tribunal. The arbitration hearings took place in 1988 and 1989 at the World Bank in Washington DC and a lengthy award on liability in favour of Mobil was delivered in March 1989.

CBI NZ Ltd. v Badger Chiyoda

The *Badger* case, a construction case, is another example. The arbitration arose

out of the Marsden Point Oil Refinery expansion construction contract. It was an international commercial arbitration. The multi-national parties to the contract had agreed all disputes in connection with the contract should be settled by arbitration in New Zealand under the Rules of Conciliation and Arbitration of the ICC. Both parties further agreed their contract should be construed in accordance with New Zealand law, and it was accepted New Zealand law governed the arbitration proceedings. The case involved an application by CBI to set aside an award of Sir Graham Speight, sitting as an arbitrator, on the ground that there were errors of law on the face of the award. The crucial provision of the ICC Rules then in force so far as the *Badger* case was concerned was article 24. It was in the following terms:

“Finality and enforceability of award

1. *The arbitral award shall be final.*
2. *By submitting the dispute to arbitration by the International Chamber of Commerce, the parties shall be deemed to have undertaken to carry out the resulting award without delay and to have waived their right to any form of appeal insofar as such waiver can validly be made.”*

By consent the proceedings seeking to set aside the award were removed from the High Court to the Court of Appeal.

All five Judges delivered detailed judgments. Space does not permit a thorough review of them all. The central question in the case was whether the famous case of *Czarnikow v Roth, Schmidt & Co* [1922] 2 KB 478 (which contains broad statements to the effect that the agreement of the parties cannot oust the jurisdiction of the King or Queen’s Courts to apply the law of England) should be extended to the common law doctrine concerning error of law on the face of the award. In other words, were there any relevant modern public policy reasons which should be held sufficient to prevent parties to an international business contract agreeing to exclude judicial review? As recorded in the report at 675, Counsel for *Badger* Chiyoda summarised its case by saying:

“...we are inviting the Court to hold that the Czarnikow rule [as to inability to oust the jurisdiction of the Court] should not apply to international commercial arbitrations in one-off contracts where the jurisdiction relating to error of law on the face of the award.”

The Court unanimously upheld this proposition. Reference was made to the New Zealand Law Commission discussion paper on ‘Arbitration’ and its reference (at p7) to a *“tension between party autonomy and judicial control, and the need to strike a balance”*. It was noted that for a decade and more there had been a strong trend in common law countries towards giving greater rein to party autonomy, partly in emulation of other systems of law and especially in international commercial arbitrations. Contributing causes had been the perceived preferences

of business people, the clogging of Court lists, and in England a phase of heavy resort to the case stated procedure encouraged by the decision of the Court of Appeal in *Halfdan Greig & Co A/S v Sterling Coal & Navigation Corp* [1973] QB 843.

It was held the ICC Rules had an international currency and it would have been singularly inappropriate to import into their construction technical distinctions existing in some areas of English law between appeals and review. The process of arbitration under the ICC Rules imposed its own safeguards by the adoption of processes whereby the appointment of the arbitrator and any award were subject to supervision. The Court was satisfied the contractual intention of the parties was to exclude any application for review of the award on the ground of error on the face of the award. It was further held ss 11 and 12 of the Arbitration Act 1908 did not prevent contracting out in these circumstances. The waiver of rights of appeal from an award arbitrated under the ICC Rules by two large multi-national companies with equal bargaining power was not contrary to public policy.

Multi-tiered Dispute Resolution

Other contributors to this book consider various alternative dispute resolution techniques which may be used instead of, or in conjunction with, arbitration. Multi-tiered dispute resolution clauses have become a commonplace in international construction contracts. They typically call for consultation, negotiation or mediation before a dispute can go to arbitration. While these clauses are fashionable, in practice they can create more problems than they solve, especially if they are not drafted properly. Moreover, a danger with such procedures is that they become just an expensive and time-consuming prelude to arbitration. The difficulties which can flow from multi-tiered dispute resolution clauses have been aptly captured in the famous article by Professor Varady called “The Courtesy Trap” (1995) in the *Journal of International Commercial Arbitration*.⁶ The following extracts summarise the theme of the Varady article:

“In a number of cases, the parties want to emphasise that the fact that they are designing a mechanism for settling disputes does not mean that they have opted for an adversary rather than cooperative relationship. Therefore, they make assurances that they shall first try to resolve all differences by friendly negotiations. Arbitration is posited only as a last resort, in case sincere endeavours to reach an amicable settlement are fruitless. Such introductory provisions of the arbitration clause are typically viewed as a gesture of friendliness and good intentions, as a display of courtesy.

Parties can, of course, always settle a dispute whether they foresaw this option or not. At the same time, no provision on joint endeavours

⁶ See also Pryles “Multi-tiered Dispute Resolution Clauses” (2001) *Journal of International Arbitration* 157, which focuses on Australian cases.

in seeking a settlement can really prevent any party from thwarting it. Yet it certainly sounds friendly, and inspires more confidence if the arbitration clause starts with:

“All disputes arising out of or connection with this Contract shall be settled amicably between the parties ... and then continues: “If no amicable settlement can be reached, the dispute may be submitted to the Court of Arbitration at the Chamber of Commerce of ...”

The context of this declaration of good intentions is, however, not innocuous. A condition is actually set, which places arbitration a step beyond immediate reach. This step may be a trying one. Placed within the arbitration agreement, any formulation – even if it was just meant to be a gesture – becomes a possible stepping stone in various procedural gambits. The question arises from when and until when is the arbitration agreement actually operative if resort to arbitration is contingent upon failure of settlement. Dilemmas and possible difficulties may emerge both in cases of failure, and in cases of success in reaching an amicable settlement.”

After providing some worrying examples of multi-tiered dispute resolution clauses causing major legal problems Professor Varady concludes:

“The parties can always settle both before and during arbitration, and they can always hinder the conclusion of a settlement if they wish so. For these reasons, a clause providing for a search for an amicable settlement does not really add novel options; what it essentially does is to contribute to a more friendly negotiating environment. But there are many ways to achieve the same purpose. A glass of wine might do better and it is less expensive too.”

The problems with them have been discussed at length in a recent special edition of the newsletter of Committee D, Arbitration and ADR of the International Bar Association’s section on *Business Law*, Volume 6, No 2, October 2001. Some of the important questions which these multi-tiered clauses raise are identified in the Committee D Newsletter as follows:

- Is the first tier agreement to negotiate or mediate prior to arbitration enforceable? In particular, how do such agreements to negotiate or mediate fare in jurisdictions which have historically declined to enforce so-called agreements to agree as indefinite, illusory or otherwise unenforceable?
- If the first tier agreement to negotiate or mediate is enforceable, what does it require substantively as far as actual negotiations or mediations are concerned and what remedies, if any, are available for the breach of such an agreement to negotiate or mediate?

- Who decides the preceding questions – the Courts on a motion to stay litigation and/or compel arbitration, or the arbitrators?
- Whether the agreement to negotiate or mediate in the first instance is enforceable has been breached and the remedy for such breach.
- Can the parties' agreements to arbitrate and the multi-tiered dispute resolution clause be enforced under laws and conventions that provide for the enforcement of arbitration agreements where the initial negotiation or mediation tier has not been completed or otherwise complied with? For example, may a party who believes that it would be futile to engage in the contractually stipulated negotiation or mediation proceed directly to arbitration and to seek judicial enforcement of its counter-party's obligation to arbitrate?

The IBA report shows that there have been differing answers to these questions around the world.

While space does not permit a detailed consideration of all of the leading cases, the following cases are representative.

Resort to arbitration may be premature

One of the cases discussed by Professor Varady is an arbitration between A Biloune (Syria) and Marine Drive Complex (Ghana) as Claimants v Ghana Investment Centre and the Government of Ghana as Respondents (reported in *XIX Yearbook Commercial Arbitration* II (1994) 11). There the arbitrators had to consider an arbitration clause containing the following provisions:

- “(1) Where any dispute arises between the foreign investor and the Government in respect of the enterprise, all efforts shall be made through mutual discussions to reach an amicable settlement.*
- “(2) Any dispute between the foreign investor and the Government in respect of an approved enterprise which is not amicably settled through mutual discussions may be submitted to arbitration;”*

Claimants started arbitration, while respondents objected that this was in violation of the arbitration agreement which required that before arbitration is commenced “all efforts shall be made through mutual communications to reach an amicable settlement”. The question which presented itself was whether sufficient efforts had been made to satisfy the condition set. The problem was that the wording ‘all efforts’ was not easily translatable into specific undertakings which would represent a fixed threshold.

The arbitrators opted for an interpretation which gave a better chance to the arbitration process, stating that the “claimants have made a clear showing of

their efforts to reach an amicable settlement” by the fact that “on more than one occasion the claimants invited negotiations with respondent on this matter. GIC failed to make any response to those invitations.”

A New Zealand decision to the same effect is a case that also demonstrates the presumption in favour of upholding arbitration agreements is *Marnell Corrao Assoc v Sensation Yachts* (unreported, High Court, Auckland, CP 297/SWoo, 22 August 2000, Wild J). The dispute resolution clause in the contract between the parties provided for: negotiation between the parties, negotiations between the parties’ chief executives, reference to the architect for his formal decision, and arbitration, in that order. The plaintiff argued that the dispute could not be referred to arbitration because the precondition that the dispute be referred to the chief executives of each party for the purpose of negotiation had not been satisfied. The Court noted that the reason for the failure to comply with the negotiation precondition was the plaintiff’s failure to respond to the defendant’s attempts to negotiate. It concluded that the plaintiff could not take advantage of his own wrong and referred the dispute to arbitration. At p 26 Wild J noted:

“That result gives effect to the general principle that the Courts should uphold arbitration, by striving to give effect to the intention of the parties to submit disputes to arbitration, and not allow any inconsistencies or uncertainties in the wording of or operation of the arbitration clause to thwart that intention.”

Similar comments were made in *On Line International Limited v On Line Limited* (unreported, High Court, Christchurch, CP 2/00, 4 April 2000, Master Venning). In the course of granting a stay in support of a dispute resolution clause which required the parties to first seek to have the matter amicably settled through discussions, with the right to seek arbitration if such settlement had not been reached within a 30-day period, the Master noted at paragraph 24, that “a party would not be able to avoid going to arbitration by refusing to seek to have the matter amicably settled”.

It is of course possible, as Professor Varady points out, to endow the conciliatory ‘gesture’ with more precise content. The 1987 FIDIC International Conditions of Contract provide in Article 67 for two preliminary steps after which resort to arbitration becomes possible:

- the intervention of the engineer; and
- an endeavour to reach an amicable settlement between the parties.

The condition of resorting to the engineer has given rise to frequent debates⁷. As far as the endeavour to reach an amicable settlement is concerned, the ambiguity of this condition is alleviated by the fact that it is deemed to be met after the

⁷ See Fouchard, Gaillard, Goldman, *Trait de l'arbitrage commercial international*, Paris 1996 20-21. See also ICC Award 6230 of 1990, reported in *XVII Yearbook Commercial Arbitration* 164 (1992)

expiration of a fixed term (56 days). It is however clear that it will not be possible to resort to arbitration if the dispute has not first been referred to an engineer.

In *Con Dev Construction Limited v Financial Shelves No 49 Limited* (unreported, High Court, Christchurch, CP 179/97, 22 December 1997, Master Venning) the Court was required to consider S 12 of the NZS 3910:1987 Standard Conditions of Contract, the scheme of which required every dispute or difference to be referred to an engineer in the first instance, with either party then having the right to require the dispute to be referred to arbitration if they were dissatisfied with the engineer's decision. The plaintiff had failed to accept a person nominated by the defendant as engineer for the contract, with the result that no engineer had been appointed; and the dispute in question had not been referred to an engineer. The plaintiff's application for the appointment of an arbitration by the Court was dismissed because of the failure to satisfy those pre-conditions.

Resort to Arbitration May be too Late

Another possible problem also mentioned in Professor Varady's article is that failure to reach an amicable settlement in the time specified in the clause may prevent valid resort to arbitration. In one case *Transport-in Handelsmaatschappij 'Vekoma B V (Netherlands) v Maran Coal Corporation (USA)* [Decision of the Swiss Bundesgericht of 17 August, 1995 (unpublished)] the arbitration clause in the parties' contract provided as follows:

“Any dispute of whatever nature arising out of or in any way relating to the Contract or to its construction or fulfilment may be referred to arbitration, such arbitration shall take place in Geneva (Switzerland) and shall proceed in accordance with the rules of the International Chamber of Commerce. The said difference or dispute shall [be] so referred by either party within thirty days after it was agreed that the difference or dispute cannot be resolved by negotiation.”

The ICC tribunal found that the clause required the party choosing arbitration to comply with the 30-day requirement. The seller contended that this requirement had not been met, and that the buyer was therefore deprived of its arbitration option. The ICC tribunal held that the dispute had been referred to arbitration within 30 days after it was agreed that the difference or dispute could not be resolved by negotiation. The facts were that the claimant had written, saying that if no reply was received by 17 January 1992 “we shall have to apply for arbitration”. The defendant did not respond at all to the fax. Three months passed and the claimant then wrote again to the defendant, saying “We continue to await a response to the settlement proposal”. The defendant then responded that it had assumed the subject was closed. The ICC tribunal said that time ran from the letter of 13 April 1992 and therefore made an award in favour of the claimant.

However the Swiss Supreme Court found that the 30 day time limit ran from 17 January 1992 and therefore the arbitration had not been commenced within the

30 day limitation period and it accordingly set aside the award, a rather startling result.

International Mediation/Conciliation

As discussed below, the world's leading arbitral institutions now offer institutional mediation or conciliation. The only notable ad hoc rules are the UNCITRAL Conciliation Rules 1980. Parties may stipulate in their contract an institution to conduct mediation when a dispute arises for several reasons. Because of the consensual nature of mediation, parties value having rules set in place, so as to avoid undue delay that may arise when the parties are deliberating how to run the mediation. Although institutional mediation involves a higher cost as an administrative fee is required, parties to an institutional mediation receive benefits otherwise missing in an ad hoc mediation. An institutional mediation provides trained staff who are experienced in organising international mediations and most importantly, a set of mediation rules which provide a reliable structure. Further advantages of institutional mediation is provision of a framework provided in selecting a mediator, the process to be followed and the administrative support provided by the institution. It is this advantage of institutional mediation which has caused a trend towards administered dispute resolution.

As noted above, all of the main arbitration institutions provide mediation services, and the growing importance of, and demand for, mediation facilities can be seen in the recent review of these mediation rules. They include:

- International Chamber of Commerce Amicable Dispute Resolution Rules, in force as from 1 July 2001 (ICC Rules);
- London Court of International Arbitration Mediation Rules, in force from 1 October 1999 (LCIA Rules); and
- American Arbitration Association Commercial Mediation Rules, as from September 2001 (AAA Rules).

In 2000 the ICC ADR Rules replaced the ICC Rules of Conciliation. The conciliation rules were replaced so as to encompass other non-binding forms of dispute resolution. The ICC ADR Rules allow the parties to choose the settlement technique that suits their dispute. However, in the absence of agreement, mediation will be used. This is a unique aspect of the ICC Rules, as other institutional rules provide for conciliation or mediation only. The new ICC ADR Rules are more compliant with the voluntary nature of mediation, with these rules maximising party autonomy.

Application and Scope of the Various Rules

Article 1 of the UNCITRAL Rules states that the UNCITRAL Rules apply to the “*conciliation of disputes arising out of or relating to a contractual or other legal relationship*”. There is no requirement for the dispute to be contractual, international or related to commercial matters. The UNCITRAL Rules are intended to emphasise

the consensual nature of mediation through the use of the words ‘amicable settlement’. This is further highlighted in Article 1.2, which allows parties to “*exclude or vary any of these Rules at any time*”. The concept of the UNCITRAL Rules applying in ad hoc mediations is demonstrated through the detailed nature of the rules. The UNCITRAL Rules are more detailed than the institutional rules by providing that any UNCITRAL Rules which conflict with a provision of law are deemed to be overridden by the relevant provision.

The AAA Rules state the mediator shall interpret and apply the AAA Rules insofar as they relate to the mediator’s duties and responsibilities, and all other rules “*shall be interpreted and applied by the AAA*”. Parties which mediate under the auspices of the AAA are deemed to have accepted the [AAA] Rules.

Although the ICC does not require the dispute to be of an international character, the dispute must be a business dispute. Similar to the UNCITRAL Rules, the ICC Rules acknowledge the voluntary nature of mediation by stipulating the provisions of the rules “*may be modified by agreement of all of the parties*”, subject to the approval of the ICC. This condition of ICC approval is justified on the basis of upholding the integrity of the ICC Rules.

Similar to the AAA Rules, the LCIA Rules state in the preamble that parties using the LCIA Rules “*shall be taken to have agreed that the mediation shall be conducted in accordance*” with the rules. Note that the LCIA and AAA do not explicitly provide for party modification of the rules, but in practice reasonable agreed modifications would doubtless be permitted.

Distinctive Features of the Various Rules

All of the above rules provide a workable framework for an international commercial mediation. The rules are quite simple and brief, and allow the institutions to be as flexible as possible. The LCIA and ICC Rules are very similar, with the provisions providing for confidentiality and the selection of the mediator almost identical. Both sets of rules are comprehensive, with the ICC Rules providing more detail regarding the termination of mediation.

The UNCITRAL Rules are more detailed than the institutional rules. This is because of the need for more structure in an ad hoc mediation that does not offer any administrative support. As stated above, the UNCITRAL Rules expressly provide for parties to modify the rules, and it is therefore expected that some of the rules will not be utilised or will be varied.

A distinctive feature of the Rules is the provision for two or three conciliators if the parties so agree. The author’s recent experience as one of three conciliators under these Rules in a conciliation between Enron and the Government of India demonstrated that a three-conciliator procedure was difficult unless certain of the rules were modified. Article 16 of the UNCITRAL Rules is worthy of note.

It provides:

“RESORT TO ARBITRAL OR JUDICIAL PROCEEDINGS

Article 16

The parties undertake not to initiate, during the conciliation proceedings, any arbitral or judicial proceedings in respect of a dispute that is the subject of the conciliation proceedings, except that a party may initiate arbitral or judicial proceedings where, in his opinion, such proceedings are necessary for preserving his rights.”

Enforceability of Mediated Settlement Agreements

One issue which has often been debated is the extent to which it is possible to convert a mediated settlement into an arbitral award enforceable under the New York Convention of 1958. The issue can be illuminated by reference to the 1999 Stockholm Chamber of Commerce (SCC) mediation rules (SCC Rules), of which Article 12 provides:

“Upon reaching a settlement agreement the parties may, subject to the approval of the Mediator, agree to appoint the Mediator as an Arbitrator and request him to confirm the settlement agreement as an arbitral award.”

The main debate surrounding the legitimacy of this practice is with regards to the issue that the parties have already resolved their dispute before the arbitrator is appointed. Although all the main arbitral institutions provide for situations where the parties settle their dispute during the course of arbitration, and give such agreements the force and effect of an arbitral award, it may be argued that provisions like Article 12 of the SCC is quite another matter because the authority of the arbitrator to exercise his jurisdiction is not invoked until after the settlement of the dispute.

Hill and Newmark suggest the answer lies in Article 2 of the New York Convention:

“Each Contracting State shall recognize an agreement in writing under which the parties undertake to submit to arbitration all or any differences which have arisen or which may arise between them in respect of a defined legal relationship, whether contractual or not, concerning a subject matter capable of settlement by arbitration.”⁸

Hill and Newmark argue that because the appointment of the arbitrator only arises once the dispute has been settled, there is no agreement to submit a dispute to arbitration as required by Article 2 of the New York Convention.

Mustill and Boyd also suggest that it is not possible to appoint an arbitrator in

⁸ Hill R & Newmark C, “Can a Mediated Settlement Become an Enforceable Arbitration Award?” [2000] 16 (1) *Arbitration International*, 81.

circumstances where there is nothing to be arbitrated:

“Where a dispute was at one time in existence, but has subsequently been resolved by agreement, the arbitrator’s jurisdiction to award upon it depends upon the timing of the agreement. If it took place before the arbitrator was appointed, he has no jurisdiction, for this appointment relates only to current disputes.”⁹

It therefore seems that there must still be a dispute in existence at the point of time when the arbitrator assumes jurisdiction.

Improving International Arbitration in Construction Cases

The ICC Commission on International Arbitration published in 2001 a helpful Report on Construction Industry Arbitrations. It contains many useful suggestions for improving the efficiency of international construction arbitrations. The Report can be downloaded from the ICC web site at (www.iccwbo.org).

⁹ Mustill and Boyd, *Commercial Arbitration*, (2nd edn., 1989) 47.

If a man will begin with certainties, he shall end in doubts; but if he will be content to begin with doubts he shall end in certainties.

Advancement of Learning, Francis Bacon

Introduction

The above quote from Francis Bacon summarises broadly much of what has been addressed in this book, and the current culture change in the construction industry. Uncertainty is inherent in construction projects and attempts to achieve certainty will lead to disappointment and conflict, whereas facing up to and accepting that construction projects are complex and uncertain will focus attention on management of the uncertainty. Effective management of uncertainty will not only reduce risks but also maximise opportunity.

In this context, we have discussed how various contract forms are used to manage risk and uncertainty. We have identified that problems are inevitable due to uncertainty on construction projects and studied the various mechanisms through which such problems are resolved. We have looked at the possible cultures that can develop on a project and seen how cultural uncertainty is controllable by the project players through the management style and contract form.

The three main topics of contract forms, culture, and dispute prevention/resolution are interrelated. The contract form and the procedures put in place for dealing with disputes act as an implicit specification for the culture and conduct of the project players. Similarly, through feedback and learning, the culture developed on a project will influence the types of contract and dispute procedures used on future projects. Eventually, this process may change an entire industry culture.

Contracts — Carrot or Stick?

Contractual arrangements may either emphasise the difference between the parties, or the mutuality – their independence or interdependence. The former can be called the ‘stick’ approach, where the contract ‘stick’ is used figuratively to keep the parties separated (and in times of conflict, to beat each other with!). The latter is the ‘carrot’ approach, where each party has a share in the rewards of the project, since it should be possible, and indeed the aim, on every project, barring the most ill conceived, to end up with a net gain for all parties. Most standard forms have a combination of ‘carrot’ and ‘stick’ and it is the relative proportion of each that will tend to dictate the nature of the relationship.

The features of contracts that act as a stick are, for example, clauses that seek to polarise the risks, such as the clause in the new FIDIC conditions pointed out by Bunni¹ *“The Contractor’s risks are all risks other than the (specified) Employer’s Risks”*.

Using the same word but in a different figurative context, Firth² referred to *“Those who try to draft smart clauses to “stick” the contractor with that risk”*

The types of clause referred to here are particularly unfair if the contractor is made responsible for the risks flowing from poor project culture³, which may be largely the fault of the Employer through choice of an inappropriate procurement approach.

Tuohey⁴ and Firth emphasised the negative consequences of trying to put the contractor into an exposed position through the contract, in particular through what could be called inappropriate mixing of carrots and sticks. For example putting projects out for tender under a guaranteed maximum price when the design is incomplete and the contractor is required to accommodate the risk of future design changes. Contracts must not only make clear the risks carried by each party, but have within them a fair mechanism for dealing with these risks.

If the parties have been separated by the stick approach, each will strive to maximise their position relative to the other. As Bunni⁵ pointed out, a characteristic of (traditional) construction contracts is:

“...risk cultivation by the parties involved, or by others associated with them, or advising them. The objectives of risk cultivation serve to enhance the position of the party involved in such tactics.”

Of course, the contractor has an equally important role to play in ensuring that the contract is fair. If certain aspects of the contract requirements are clearly unfair to either party or if the contractor spots a potential loophole, then it is in the best interests of the project and any ongoing relationship, for the contractor to point these out and seek a change to the contract before signing, or to refuse to enter into it⁶.

Ideally a contract will achieve a fair balance between carrot and stick. The risks as well as the rewards need to be shared equitably. Target cost contracts are a good example, such as the NEC Option C, where a mechanism for sharing cost savings or overruns is put in place. Related to this, roles and responsibilities need to be clearly defined and we have seen how modern forms of contract are clearer and more readily understood by their intended users than their traditional counterparts.

¹ Bunni, Chapter 4, page 39.

² Firth, Chapter 10, page 180.

³ Le Masurier, Chapter 4, page 45.

⁴ Tuohey, Chapter 4, page 58.

⁵ Bunni, Chapter 11, page 219.

⁶ Henriod, Chapter 10, page 219.

Project Culture — Contractual or Managerial?

The style and effectiveness of the management of a project is related to the culture, which is also influenced by the contract.

Kay⁷ suggested a fundamental change in the industry culture is from relationships based on contract direction, towards business relationships based on aligning objectives; he summarised three construction contract paradigms covered during the conference. Firstly the constructivist approach, which says that the contract governs the relationship and the more clearly we express the roles and responsibilities, the more clearly defined the relationship will be. Secondly, the realist approach, which says that the relationship is independent of the contract, that no matter what form of contract you have, the people will determine the relationship. Thirdly, the synergistic approach, which combines the other two, where the relationship is the product of the contract and the people. In relation to the synergistic approach, Kay suggested that the culture change is about moving towards relationship-based contracting, seeing the way we operate from the point of view of the business relationship and how to collaborate, to gain more than the sum of the parts.

Standard forms of contract, as discussed earlier, are based on the constructivist approach. The realist approach could also be called a fatalistic approach, i.e. no matter how fair or unfair the contract, a project's success, or failure, will depend upon the maturity or enlightenment of the project participants. There are certainly examples of project teams rising above what would be generally considered adversarial contract conditions, to develop a collaborative culture. Equally, there are examples of projects that have started off with Partnering Charters, where the players have reverted to traditional stereotypes and become adversaries.

Most standard forms of contract rely implicitly on the involvement of enlightened people for project success and do not address the risks of poor management, expressed by the realist approach. In contrast the NEC, with its principle objective to be a stimulus to good management, directly addresses the management-related risks. In this sense it is the only standard form of contract that recognises that effective management should not be left to chance; leaving it to chance is exposing the project to one of the greatest risks — an organisational failure⁸.

Manifestations of the synergistic approach are seen in the industry. For example non-contractual relationships such as alliance agreements⁹ and the tendency to use non-price attributes in the selection of companies and individuals for projects, based on their track record.

Whilst few would argue against collaboration in preference to confrontation for overall project success, there is a conundrum associated with the use of

⁷ Contribution from Nigel Kay of Sinclair Knight Mertz, NZ at CAE Conference on the *Contract in Successful Project Management*, Christchurch, February 2002.

⁸ Le Masurier, Chapter 4, page 45.

⁹ See Freeflow Alliance, Chapter 8, page 119.

collaborative approaches in the management of construction projects. Promotion of collaboration relies on the involvement of sufficiently mature and trusting project players, however, to gain the necessary trust and maturity, the players need to have experienced and recognised the benefits of such management approaches.

If a project owner's previous experience of the industry is one of poor service, then that owner may not have developed the necessary trust and maturity to opt for a contract form that promotes collaboration and sharing of risk and reward. For these owners, the contract of choice will be one that strives to achieve certainty and isolate the owner from the project risks. Experience shows the harder they try to mitigate their risks, the worse their position can become, whereas adopting a collaborative form of contract will generally lead to a more satisfying outcome¹⁰.

Disputes — Prevention or Cure?

Notwithstanding the form of contract and culture in place on a project, the uncertain nature of construction means that problems are inevitable. The mechanisms for dealing with such problems vary with the contract form and culture, but can be broadly categorised as either preventative or curative, when considered in relation to problem escalation and disputes. In the preventative category are management-based approaches integral to the project team, such as facilitated discussions¹¹, culture change programmes¹² and issue resolution ladders¹³, a feature of partnering projects. A characteristic of the preventative approach is that problems are resolved within the project team. In contrast, the curative approach is characterised by dispute resolution involving people external to the project team.

Traditional forms of contract attempt to prevent problem escalation through the impartial role of the Engineer, who is indeed integral to the project team, but as Burrows pointed out¹⁴, the dual responsibility of the Engineer under the contract can prove to be too heavy a burden. Hence, in these traditional forms of contract, a curative approach may be used when a neutral party (the 'expert' in NZS3910¹⁵) is introduced after a dispute has arisen that cannot be resolved among the project parties.

The new forms of contract recognise that, in place of the traditional 'Jekyll and Hyde' role, an engineer can realistically fill only one role. It was suggested¹⁶ that this presents engineers with a new opportunity to be more proactive and fill a

¹⁰ Stockman, Chapter 8, page 112.

¹¹ Pavelka, Chapter 9, page 159.

¹² Le Masurier, Chapter 4, page 49.

¹³ Henriod, Chapter 9, p 164.

¹⁴ Burrows, Chapter 2, page 14.

¹⁵ Wilkinson, Chapter 7, page 103.

¹⁶ Brent Johnson, of Beca, Carter, Hollings & Ferner, at CAE Conference on the *Contract in Successful Project Management*, Christchurch, February 2002.

role as facilitator of cooperative partnerships, separate from the engineer filling the role of owner's representative, the arrangement used in NEC¹⁷.

Dispute Review Boards¹⁸ (DRB) straddle the prevention/cure boundary since the DRB keeps in continuous close contact with the project but is one step removed from the project team. There is clearly benefit in having a neutral party (or board), in place from the start of a project, to whom any disputes are referred as and when they arise, rather than introducing the neutral after a dispute has arisen and the project is already on the back foot; in the former case the neutral can be proactive in preventing disputes from escalating. Of course, internal preventative facilitators can be used in conjunction with DRBs and any other curative dispute mechanisms.

In the tiers of dispute resolution¹⁹ each step, from team-based, to DRB, to adjudication and finally arbitration, manifests as a quantum change in a project's culture. The first, possibly most significant step, marks the change from prevention to cure, internal to external, and represents, to some extent, a failure on the part of the project team and will consequently undermine the relationship.

Strong views have been expressed on this topic by authors of the various papers. Both views need to be seen in context. From the perspective of engineers, who would like to retain control of the process and hence tend to favour the preventative approach, a dispute going to adjudication or arbitration reflects as a failure on themselves. From the perspective of an adjudicator or arbitrator who will generally have wide experience of the causes and potential complexity of construction disputes, their role as an impartial 'hand on the tiller', if used in time, can help to keep the project moving forward.

The two viewpoints probably also reflect the experience of the respective protagonists. Few engineers will have been involved in projects that have reached the point of adjudication or arbitration; most adjudicators and arbitrators will not have been involved in projects that have run smoothly.

Barnes²⁰ has given the engineer's side of the argument saying that mediation, dispute review boards and alternative dispute resolution generally are approaching dispute resolution from an uncomfortable stand point, i.e. curative. In a scathing attack on arbitration Barnes asserted that arbitration is "*a seriously defective method of settling disputes on engineering and construction projects. It is ludicrously slow and ludicrously expensive and its outcome is very often random*"

The common ground between both views is that problems and disputes should be resolved before they fester and develop into much greater disputes that damage the relationship further.

¹⁷ Barnes, Chapter 6, page 86.

¹⁸ Henriod and McDonough, Chapter 9, page 168.

¹⁹ Bunni, Chapter 11, page 216.

²⁰ Barnes, Chapter 6, page 88.

The protagonists of the 'cure' school of thought therefore argue that contract terms that require multi-tiered dispute resolution can mean that unsuccessful attempts to resolve the dispute at a lower level, delay the reaching of a final decision, which can further complicate the issue.

Williams²¹ argued that the problem arises because a clause that requires attempts at amicable settlement by various means before resorting to arbitration, places arbitration a step beyond immediate reach. The dilemma is then over when arbitration is invoked *"if resort to arbitration is contingent upon failure of settlement"*. For example, either one of the parties may not agree to arbitration because they feel that other means of settlement have not been exhausted.

Barker²² addressed the middle ground between these two views when he said: *"I should have thought this provision (to negotiate) unnecessary to insert in a contract. As a matter of practical reality, people usually do negotiate initially and proceed to arbitration or litigation as a last resort"*.

This point again emphasises the interaction of culture and contract. The appropriate project culture based on an interdependent relationship would ensure that every means for amicable resolution is explored, prior to resorting finally to a provision for arbitration in the contract. Another point of agreement between the two views is that arbitration is preferable to litigation and so rather than default to the latter, it is important to state in a contract, however friendly it is trying to be, the mechanism for arbitration as the last resort.

The Way Forward

The new approaches discussed in this book expand the range of options available to industry players. The most appropriate approach will depend on the individual project and the market in which it is undertaken. At one extreme, there will always be one-off clients who see no benefit in developing a relationship with their supply chain and who will take their chances on lowest price bidding with maximum risk transference through traditional contract forms. At the other extreme, there are large infrastructure asset owners who can benefit from forming long term relationships, less reliant on contracts, with construction companies willing to align their business objectives with those of the customer.

The maturity of the industry will influence the choices available. In an immature market, where each party sees themselves as independent from other project parties and each seeks to maximise their own rewards, collaborative forms of contract are inappropriate. In such markets there will be winners and losers; providing all the players understand and accept this they will probably see no reason to change. However, as projects get larger, the stakes get higher and being a losing party has greater ramifications²³. Through a type of evolution, the market

²¹ Williams, Chapter 11, page 238.

²² Barker, Chapter 11, page 208.

²³ See Kariba dam example by Henriod, Chapter 10, page 190.

has matured in some countries, to recognition of the interdependence of project players and processes; the immature markets can benefit from this example and follow the same evolutionary path more rapidly, if they chose.

There is plenty of experience emerging in the mature markets to show how new types of relationship and forms of contract can be applied to a range of circumstances. The onus lies on construction professionals to understand the benefits and risks associated with any particular project strategy and advise clients appropriately; limited knowledge and experience of new approaches in the profession is not to be an excuse for continuing the status quo.

The extent to which culture change occurs will depend upon the driving force behind it. A project crisis can cause a project's culture to change²⁴. Similarly, an industry crisis can cause an industry culture change. The bigger the crisis, the greater the drive and the more radical can be the solution. The current UK and USA industry culture change is a reaction to the crisis of extreme adversity in the 1980s and 1990s.

In New Zealand, the industry culture did not degenerate to the level of adversity experienced in the other parts of the world, so perhaps the driver for change is not so great in this country. Nevertheless, the contractual relationships in New Zealand are far from ideal on some projects and there is scope to improve generally.

The CAE conference highlighted the level of interest in new approaches to construction, but as one delegate²⁵ pointed out, *“the ten thousand people who aren't here, the clients, the constructors, the suppliers, the designers ... are the ones that need to be convinced of the move to a relationship-based contract”*.

There is a challenge to spread the message and inform others of the alternatives to the status quo. In particular to inform clients of the options open to them when procuring construction work, since it is the clients who have the greatest opportunity to influence the project culture.²⁶ The Rethinking Construction²⁷ initiative is doing this very successfully in the UK and we would like to establish a similar initiative in New Zealand and our region of Asia and Oceania.

²⁴ Le Masurier, Chapter 4, page 49.

²⁵ Nigel Kay, Sinclair Knight Mertz, NZ.

²⁶ Tuohey, Chapter 4, page 58.

²⁷ See www.rethinkingconstruction.org

Conclusions

A

Appendix A

This section includes three principal parts: first, a summary of presentations made by representatives of the World Bank and the Asian Development Bank at the CAE Conference, 17-19 February 2002; second, special papers on Contracts and Project Management in China, by Lu Youjie, and on the lessons learned from experience with international joint ventures in Asia, written by Lu Youjie and Tan Wee Teck; and third, an example of the Worley Project Risk Management process.

The World Bank was represented by Armando Araujo, Director of Procurement in the Operations Policy and Country Services Vice-Presidency; and the Asian Development Bank by Ross Clendon, Senior Counsel. The notes that follow have been taken from transcripts of their presentations, and the editors accept responsibility for any interpretation that was necessary to prepare the précis for publication, and for the notes in italics.

The World Bank¹: Points of View and Issues

Armando Araujo, Director of Procurement, Operations Policy and Country Services, The World Bank ²

On Partnering

There are difficulties in applying the concept of partnering if the Principal is a government. For example, partnering could raise issues of (lack of) transparency. In addition, in some developing countries there could be issues arising from the relatively low level of sophistication of some of the government organizations that would be the Principals in contracts, resulting in a difficulty to develop mutual trust with a highly experienced and knowledgeable contractors from the industrialized world.

Also, problems may arise with government employees who normally do not want to take decisions by themselves: they would wish to protect themselves against a change of government (and the personalities involved), which could result in grave personal problems if the employees, acting as project managers, had not taken decisions based on the strict letter of the contracts. They would thus need to have very explicit, well-defined rules to apply in a partnering situation, or somebody else to share the responsibility with. [*The implication is that there would be a loss of flexibility, as would be required in a true partnering arrangement, where decisions may not necessarily be covered by the letter of the contract*].³

Alliancing [*when interpreted as a long-term strategic arrangement*] would pose another type of problem in World Bank-financed procurement: it implies the initial selection of a firm that would then be the sole contractor for other projects over a long period. This would entail lack of competition for ensuing contracts, and competitive bidding is a basic principle of the Bank's procurement Guidelines (which are of mandatory application in *all loans*).

The World Bank has participated in partnerships with communities, and helps finance many projects directly implemented by local communities. For instance, Armando Araujo was Task Manager of a project in Argentina for the construction of 5,000 houses, in a decentralized and participative approach, where the communities were directly in charge of construction. This was a great partnership, not with contractors, but with the actual beneficiaries of the loan.

[*The World Bank has participated in partnering in construction contracts for its own Headquarters buildings—see Chapter 9*]

¹ The World Bank, or International Bank for Reconstruction and Development (IBRD), was established in 1947 to assist in the reconstruction of the countries devastated by the Second World War. That role changed gradually, as the reconstruction phase was completed, to a role of assisting in the development of the Third World. This is principal role today, although reconstruction of war-torn countries — the victims of other wars — is still an important commitment.

² Mr Araujo's comments have been transcribed from recorded speeches made at the CAE Conference, February 2002. While they express his views and opinions, they may not reflect current policy of the World Bank.

³ The text in italics within square brackets are Editor's notes.

On Disputes Review Boards

“I am considering ... to propose a new role of technical advisor. That could be a role played by ... dispute review boards, which today are only addressing disputes. In future, they could be changed to also assist the project manager in taking decisions. ... boards of advisors are already assisting the project implementation unit in the construction of large dams. ... this concept could evolve to help the board to take a more proactive approach in managing the contract and giving the sufficient technical comfort for the project manager to defend himself in the future...”

[The above is an almost verbatim quote. Much as the proposal would help project managers to protect themselves by disseminating responsibility among a larger group — and we doubt the wisdom of such arrangement, which would mean introducing management by committee — it is contrary to (a) the generally accepted principles for the operation of Disputes Review Boards, the essence of whose participation in a project is their total independence and impartiality, to enable them to reach recommendations that are acceptable to the Parties; and (b) the equally accepted principles of the technical panels established under the rules of the International Commission on Large Dams [ICOLD], which are primarily concerned with the safety of the structures, and not with management of construction].

Bank Clearances

Speakers mentioned that some banks require that they clear all variations. The World Bank does not require such clearances. All World Bank-financed contracts must include a provisional sum to cover variations and quantity and price increases. The Bank also accepts increases in the total contract value of up to 15% without prior approval, as well as extensions of time, provided they are not material. The World Bank does not allow that clauses pertaining to unforeseen conditions be deleted from contract forms: the standard form must be used in its entirety. In that way the World Bank protects the interests of the Bank's borrower, and those of the contractor serving that borrower.

Contract Securities

World Bank-financed projects are normally covered by three kinds of security: the bid, advance payments, and performance securities. For the bid security, the Bank requires that [its borrowers] receive an ‘on demand’ guarantee, issued by a bank, a surety, or an insurance company. The borrower is only required to certify to the issuer of the security that the bidder has withdrawn its bid, failed to sign the contract, or failed to produce a performance guarantee. Likewise, advance payment security must be covered by guarantees payable on demand, since they are protecting cash advances to the contractor. The World Bank does not require that performance securities be ‘on demand’ guarantees: they may be normal bonds. The texts of all these securities must follow the standard text in the Bank's Standard Bidding Documents, or a similar text that does not conflict with the

requirements of the standard.

Information Technology

The World Bank has financed many IT contracts. The Bank's standard contract documents for IT permit flexibility. However, there is an issue for which "we do not have an answer: the captivity of the borrower, or the direct client, by the industry". Once a technology has been chosen, the purchaser is captured by the supplier, for all service and maintenance (and upgrades).

New Developments

"We are now working on output-based contracts. Some people call them performance-based contracts, but we prefer to call them 'output-based'. This covers a big spectrum of contracts. We are now finishing one for maintenance and rehabilitation of roads that will be based on this concept ... the contractor will be responsible, not for the design, materials or other inputs, but for the quality of maintenance performed". When referring to concessions (BOOs, BOTs) their performance will be judged by their outputs: for instance, in a metro (rail) system, the (key performance indicators) may be the number of people transported, the quality (of ride or service), or the interval between trains.

The World Bank is working with the other multilateral banks in the harmonization of bidding and contract documents. This is a big challenge. "We have already agreed with the other banks a standard new document for procurement of goods that will be used by all the banks. We are working now on a prequalification document, for civil works, and are starting to prepare a new (bidding document) for civil works." Part of the discussion hinges on the issue of whether to have one umbrella contract for all purposes, or specific contracts for specific situations. The World Bank favours the latter.

Another area in which the World Bank is working intensively is in the development of local capacity in borrowing countries so they can handle their own procurement. This is being done for the various activities and types of contracts, and assessments are being carried out to determine the quality of local procurement processes, "so that if a country's procurement procedures are sound and have a good international base we could accept those procurement processes."

The Bank is also trying to help its borrowers in the area of electronic procurement. Pilot projects are already under way in Mexico and elsewhere in Latin America.

The Asian Development Bank

Ross Clendon, Senior Counsel, Asian Development Bank, Manila⁴

The Bank

The Asian Development Bank (ADB) is a regional multi-lateral development bank, a ‘younger brother equivalentxc’ of the World Bank. It has been in existence for 35 years, and now has 58 member countries. The United States and Japan are the two largest shareholders, with roughly 13 percent each of the total shareholding. New Zealand’s share is about 1.5 percent, and Australia’s four percent. This places Australia among the larger shareholders after the U.S. and Japan. Other large shareholders include China, India, Germany and Canada. Of the 58 members, roughly two thirds are eligible to borrow from the Bank (the ‘developing member countries’); the other third are developed member countries. The geographical span of the Bank extends from Afghanistan in the west, to the Pacific islands.

The headquarters of the Bank are in Manila; the ADB has a staff of 700, of which 30 are lawyers. Lawyers are outnumbered by engineers! The skill mix is changing, however. It is moving into such areas as capital market development and softer social issues, as the overarching focus of the Bank now addresses poverty alleviation. Some of the social matters being addressed by many experts in the region include the environment, gender issues, and resettlement.

Last year the ADB lent approximately US\$6.0 billion, spread among about 80 different projects. The money the Bank lends is raised in the world’s capital markets (similarly to the World Bank). Like the World Bank, the ADB has a triple-A status in those capital markets, and that means they can borrow at ‘best rates’; the funds are then made available to member countries, with a small spread over the cost of the borrowed funds to cover administrative costs.

The traditional role of the ADB has been that of lending for major infrastructure development by governments: roads, highways, ports, airports, water and sanitation, rural irrigation, agriculture, health and education. This started to change some 15 years ago, when the Bank began working with the private sector, something that had been impossible under the founding charter⁵. The ADB also started work in areas which had been the province of the International Monetary Fund, such as lending, not for specific infrastructure or other projects, but to achieve policy reform in certain sectors. The ADB refers this type of loan as ‘programme lending’ as opposed to the World Bank, which calls it ‘structural adjustment lending’.

The ADB helping the private sector—an example from Nepal

The Bank assisted in the establishment of the first Build, Operate and Transfer

⁴ Mr Clendon’s comments have been transcribed from recorded speeches made at the CAE Conference, February 2002. While they express his views and opinions, they may not reflect current policy of the Asian Development Bank.

⁵ In contrast, the World Bank has a subsidiary, the International Finance Corporation, which is dedicated to operate in the private sector of developing countries (Editor’s note).

(BOT) Project in Nepal, a run-of-river hydro power station, developed without participation of the government. The Bank assisted as a 'neutral party', seeking to ensure that the deal that was finally settled on would be in the best interests of all parties. "The original construction contracts for civil works and the contracts for mechanical (and electrical) engineering were drawn up by the suppliers of those services. They were not going to be seamless; there would have been a lot of problems. That was one example where the ADB acted as the family doctor, having been called for help. The people of Nepal felt comfortable getting what they felt was independent advice."

One of the interesting aspects of developing the contractual basis for the first Nepal BOT was the matter of the resolution of disputes, which could have been the source of an impasse if limited to referral to the local courts of justice. The intervention of the ADB assisted the government in making the necessary legislation amendments to make the project 'bankable', by introducing international arbitration as the means for dispute resolution.

As a rule, the ADB does not participate in projects where the private sector is willing to take the burden or the challenge. Its role is that of a lender of last resort, lending where the private sector will not. In the case of this project in Nepal, the Bank played a catalytic role that enabled the first BOT project to go ahead; this was followed not much later by another BOT project, this time arranged in much less time.

Manila Water

The ADB is currently involved in trying to assemble a US\$350 million financial package for a concessionaire who has been awarded a 25 year contract to run the water supply for Manila. The key risk considered was the political risk: in this case, the developer needed an assurance that the provisions for setting the rates would be honoured, and not over-ridden for political purposes. A technical grant from the ADB will be used to ensure there is institutional capability for the technical assessment and setting of the water rates.

The Bank will also participate in the financial package, with about 10% or 15% of the total. Being a lender of record, this will ensure that the ADB's various privileges and immunities — such as those relating to taxation and the conversion to foreign exchange and remittance of funds — will apply. This is very attractive to other banks, and can turn a project into a 'bankable' proposition through the presence of the ADB (or the World Bank or IFC, which have the same catalytic effect).

Programme Lending in Kurdistan

A Programme Loan is being prepared for Kurdistan, to assist the country introduce a Corporate Government and Enterprise Reform Programme. One of the problems it will tackle is the reinstatement of an Arbitration Centre which is inoperative

because of provisions in the Constitution which require all disputes to be addressed by the Courts of Law. Even though Kurdistan is a signatory of the New York Convention on arbitration, this procedure for resolving disputes is not available in the country. Without international arbitration, foreign investors may shun lending to Kurdistan.

The Harmonisation Exercise

The regional development banks are involved in an on-going exercise with the World Bank, seeking to harmonise the hitherto ‘recommended’ bidding documents⁶ into standard documents. Some documents have already reached that stage; however, two important bidding documents, those for civil works — major and ‘smaller’ — are still being worked on. Nevertheless, it is expected that the whole process of ‘harmonization’ will be completed before long. The next meetings of the inter-bank drafting group is scheduled for later in 2002.

⁶ The World Bank’s Bidding Documents are ‘Standard’ documents, whose use by its borrowers is required, not just recommended (Editor’s note).

Contracts and Project Management in China⁷

Lu Youjie and Tan Wee Teck

Historical Perspective

Project management in China dates back to ancient times, as evidenced by a number of well-known construction projects such as Great Wall, Great Canal and the Forbidden City. Modern tools, techniques and methodologies for project management, such as the Critical Path Method, Programme Evaluation and Review Techniques, and Graphical Evaluation and Review Techniques were brought to China in the 1960s when China launched its nuclear weapon and missile/satellite programmes. The defence, aerospace, science and construction sectors were the first areas in China where modern project management techniques were applied. Credit for dissemination of the techniques should be given to Professor Loo-Keng Hua, a leading mathematician in China at that time. Knowing the potential of successful project management for economic growth, social development and defense strength of China, he and his assistants, setting their pure mathematics research aside, began to promote network-based techniques throughout the country. That is how modern project management took root in China.

The World Bank provided the second stimulus for project management to grow at a very fast pace in China. China resumed its membership of IBRD (the World Bank⁸) in 1980. Lubuge Hydroelectric Station in Yunan province was the first hydroelectric project in China partly financed by an IBRD loan. Its construction started in 1984. International competitive bidding was used for procurement of the construction contract for the diversion tunnel of the project. The contract entered into between the employer and a Japanese contractor included the FIDIC Conditions of Contract, as recommended in the (then current) Sample Bidding Documents for Procurement of Works of the IBRD. The Japanese contractor successfully managed the diversion tunnel subproject following the modern project management principles embodied in the FIDIC Conditions of Contract. Stimulated by the success of this project, the Chinese government began a reform of the construction industry in 1984. One of the principal items in the reform agenda was the promotion of project management techniques throughout the industry in China.

MOC's Efforts to Enhance Project Management Capability in Construction

The Ministry of Construction (MOC) has been playing a leading role in promoting the improvement of project management in China. Before 1984, construction enterprises were under the administration of the central ministries and/or local governments. Their operations were restricted by their supervisory government agencies to certain sectors of the economy and/or to geographical areas. Their

⁷ This paper draws from 'Construction Practice in China', parts I and II, unpublished monograph for Civil Engineering students at the Hong Kong Polytechnic University, by Lu Youjie, July 2000.

⁸ IBRD is the International Bank for Reconstruction and Development, widely known as 'the World Bank'.

workloads and resources were allocated by their supervisory government agencies. On the other hand, the majority of the enterprises were of general type, i.e. they undertook the work of all the trades involved in a construction project, without using subcontractors. All their human resources, skilled and unskilled workers, engineers, office staff and managers were permanently employed, no matter how big their workload was. The system resulted in low efficiency and effectiveness.

Starting in 1984, the MOC launched a number of reform programmes, aiming to raise the efficiency and effectiveness of the state-owned construction enterprises and the construction industry as whole. One of the issues that the reform programmes addressed is closely related to the implementation of project management techniques by the enterprises — ‘separating field operations from management’.

The ‘separation’ has taken place both within and between the enterprises. On the one hand, all the state-owned enterprises have given up the system of permanent employment of line workers, especially the unskilled labour. The permanent positions have been kept only for the technical and managerial staff and a limited number of skilled operatives, subject to renewal of employment contracts regularly at intervals of three or four years. The new system has enhanced flexibility in matching the workforce with the workload and reduced labour costs.

On the other hand, a majority of the enterprises have been restructured to concentrate on building work, specialist or labour-only subcontracting companies, while only a small portion of them have kept their general contracting status. The reorganisation has not only increased the efficiency and effectiveness of the resources available to the state-owned construction enterprises and the construction industry as a whole in China, but it has also made the enterprises more project-oriented and friendly in their operation.

While the industrial restructuring got under way, a number of steps were taken by the State Planning Commission (SPC) and MOC to promote project management in the construction enterprises. In November 1987, the SPC instructed 15 selected engineering enterprises to apply project management techniques to their operations. Encouraged by the success of the selected enterprises, many other enterprises followed suit. The excellent performance of 186 project managers was recognised at a national conference held by the State Council in 1991, which further encouraged the enterprises to apply project management techniques to their operations.

The Construction Project Management Committee was formed under the China Construction Industry Association in 1994. The Committee held symposiums on construction project management in September 1994 and October 1995 and the participants exchanged their experiences, opinions and suggestions, covering a wide range of topics on construction project management in China. The Department of Construction Industry and the Department of Construction Supervision issued *Guidelines for Construction Enterprises to Further the Application of Project Management Techniques* in May 1996, requiring that efforts be made to put

project management on the right track. The MOC issued the *Procedures on Administration of the Qualification of Construction Project Managers* in January 1995 after the *Tentative Procedure on Administration of the Qualification of Construction Project Managers* issued in July 1992 had been in effect for three years.

In order to make the project managers competent for their roles and duties, and bring them eventually up to the standards set out in the above *Procedures*, a series of training programmes have been designed and offered under the auspices of the MOC to project managers and other members of project management teams. In June 1992 MOC issued a notice to all the state-owned construction enterprises entitled *A Notice on the Nation-wide Training of Construction Project Managers*, requiring that textbooks, tests and certificates meet the standards of MOC. Following this notice, a drafting team was formed to write three textbooks to be used in the training programmes throughout the country, and the first educational institutions or training centres were accredited as project management training providers in April 1993. The three textbooks were superseded, after three years in use, by six new textbooks published in January 1995.

One hundred and forty educational institutions or training centres had been accredited by MOC as project management training providers up to the end of 1995. During the same period, 321,983 project managers took the training courses and 297,774 of them were certified by the MOC.

Starting from July 1, 1996, all applicants must be certified, as required by the *Procedures on Administration of Qualifications of Construction Project Managers*, before they take a position of project manager. At present the training and certification in project management is going on regularly in China.

The Construction Project Management Committee produced a *Construction Project Management Procedure* in April 2002 under the auspices of MOC. The Procedure is based on the experience and lessons that the construction community in China learnt over the past ten years. It represents the recognition of project management as an effective project development approach, and a further commitment to its dissemination by the construction community in China.

At present the typical management team for a construction project in China is organized as shown in Figure 1.

The World Bank's Contribution to Enhance Project Management Capability in China

Just as is happening in other parts of the world, project management is no longer limited to construction but has been adopted in most economic sectors in China. To a certain extent, credit for this belongs to the World Bank. The World Bank offered a number of training programmes in Beijing, Dalian and Shanghai, aimed at improving the project management capability of China, since it started lending

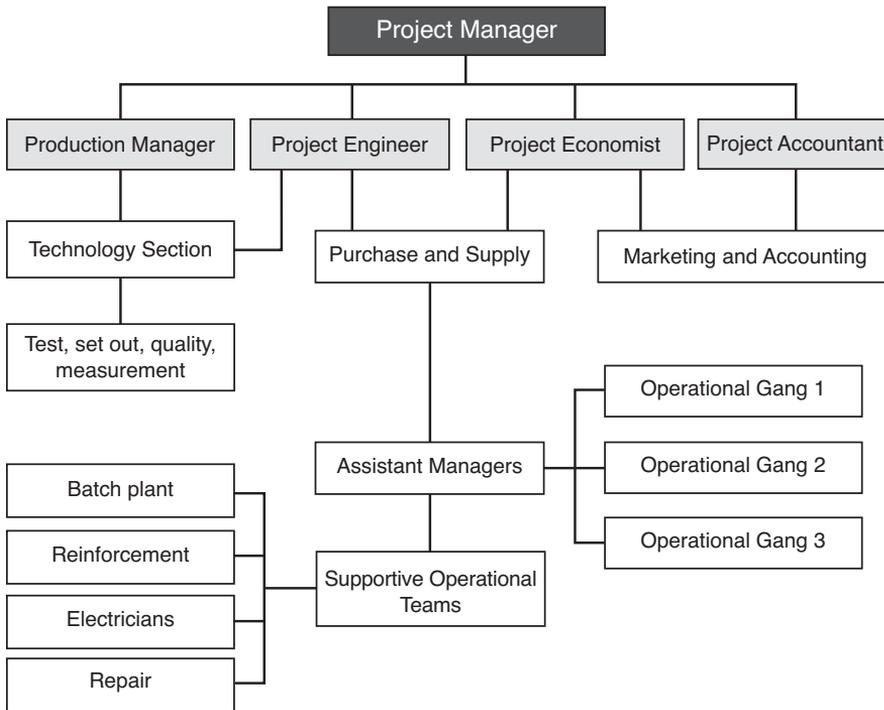


Figure 1: Organization of a Project Management team

to China in the early 1980s. Among all such efforts is a programme for the training of trainers that was implemented in 1994 and 1995. It was financed by a grant from the World Bank. In July 1994, IBRD made an IDF (Institutional Development Facility) grant in an amount of US\$478,000 to China for the development of project management training capability, and the establishment of an institutional framework for such training. The activities that the grant covers include, among other things, (a) identification, translation and preparation of training materials, including case studies for training courses, (b) a training programme in Washington DC for an initial number of 44 trainers from training networks' institutions to be selected, and (c) four training courses for project managers and officials from concerned government agencies. The Ministry of Finance (MOF) of China contributed 33 percent of the total cost of US\$757,650.

As required by the grant agreement between the IBRD and MOF, 44 persons were selected from the universities, training centres and other education institutions in China in November 1994. The 44 trainees attended a two-phase programme of training in project management. The first and second phase were held at Tsinghua University, Beijing in December 1994 and at EDI (the Economic Development Institute of the World Bank, Washington, DC) in March and April 1995. The instructors from the World Bank and the local consulting firms highly appreciated the enthusiasm, hard working and learning motivation on the part of the Chinese

participants. Immediately after the training programme a training network was formed with five major universities in Beijing, Tianjin, Shanghai and Xi'an, aiming at training project managers and specialists throughout the country on a regular basis. The Project Management Center of Tsinghua University is currently leading the network.

To make the training activities sustainable, the Project Management Center of Tsinghua University had a series of textbooks in project management published by Tsinghua University Press. In major cities in China many private firms use the textbooks as teaching material when they offer training services to their clients.

The Chongqing Urban Environment Project (1998) and the Liao River Basin Project (2000) were proposed for World Bank financing. Both projects have an institutional strengthening and training (IST) component. The author was employed with World Bank funds as a consultant to devise the training programmes for the staff of the specialist companies concerned with the environmental components of the projects, as well as for the government officials involved in the two projects. The majority of courses are project-management oriented. Table 1 is an excerpt from the report the author wrote and submitted to the World Bank mission.

In conclusion, the World Bank has played an important role in promoting project management in China.

The PMBOK Guide

The author translated PMI's Standard Committee *A Guide to the Project Management Body of Knowledge* (PMBOK, August 1994 draft), into Chinese in December 1994. The translation was used, as a piece of teaching material, for the training of trainers programme financed by the IDF grant from IBRD. That is the beginning of access by the project management community in China to PMBOK. At present, use of the PMBOK 2000 edition is extending in China, and it has become the basis for writing a number of textbooks for training in project management in China.

The FIDIC Conditions of Contract (Red Book)

A few Chinese state-owned construction enterprises, with the help of Hong Kong businessmen, began to undertake construction contracts outside mainland China in the late 1970s, exposing the Chinese construction community to international conditions of contract for building and civil engineering construction, including the FIDIC Conditions of Contract for Works of Civil Engineering Construction (the Red Book). On the other hand, the World Bank includes the Red Book in its standard bidding documents for procurement of works (previously the Third Edition and currently the Fourth Edition). Experience in China shows that most of the civil engineering works procured under the FIDIC conditions have turned out very successfully. The Chinese employers find that the project management practice and the employment of an impartial engineer, as provided for in the Red Book,

Project phase	Training subject	Training Method	Location	No. of persons	Duration (weeks)	Cost	
						¥000	\$000
Preparation	World Bank lending procedure	Lecture	Shenyang	2	0.6	4.2	0.51
	WB financed projects-case studies	Study tour	Jinzhou	2	2	13	1.57
	Project management	Lecture	Shenyang	2	4	15.4	1.85
	Project financing	Lecture	Shenyang	2	0.6	4.2	0.51
	Project cost estimating and control	Lecture	Shenyang	2	0.6	6.3	0.76
	Project financial & economic evaluation	Lecture	Shenyang	2	0.6	4.2	0.51
Sub-total						47.3	5.69
Design and Procurement	Procurement of consultant service	Lecture	Shenyang	2	0.6	4.2	0.51
	Procurement of works	Lecture	Shenyang	2	1	6.3	0.76
	Procurement of goods	Lecture	Shenyang	2	1	6.3	0.76
	Membrane electrolysis techniques	Study tour	Abroad	5	3	218.3	26.30
Sub-total	Membrane electrolysis techniques	Study tour	At home	5	2	44	5.30
						279.1	33.63
Construction	Construction observation	Lecture	Shenyang	2	2	9.1	1.10
	Engineering techniques	lecture	Shenyang	2	2	9.1	1.10
	Basic management software	Lecture	Shenyang	2	1	6.3	0.76
Sub-total						24.5	2.95
Operation	Pre-job training of workers	Lecture	locally	100	24	1000	120.48
	New analysis processes	lecture	At home	5	8	100	12.05
	Engineering staff training	Lecture	At home	6	4	66	7.95
	Management staff training	Lecture	At home	10	8	65	7.83
Sub-total						1231	148.31
Total						1581.9	190.59

Table 1: (7.1.7 in the Report) Jincheng Paper Co., Ltd – training needs

have been key factors for the successful development of projects.

FIDIC signifies a high level of sophistication in construction project management to the construction sector in China. FIDIC is highly regarded and well known throughout the industry. The construction sector increasingly needs engineers who are fully conversant with the principles of the FIDIC contracts, to bring its human resources to the same standard as those of the engineers engaged from overseas.

On the other hand, a significant change has occurred recently within the Chinese engineering design industry. Design professionals in China are primarily technically oriented because of their education, training and experience. Many of them have not had the opportunity to undertake consulting work prior to the design phase of a project. However, the increasingly market-oriented clients and the growing size and complexity of the infrastructure projects being developed have created a major demand for a much wider range of consulting services. The design professionals have increasingly had to take on the role of the project managers and facilitators responsible for a broad scope of services. The majority of design professionals do not, however, have the necessary skills, and it has been realised that they need to be trained to the internationally-accepted standards of consulting practice required to manage projects under the FIDIC conditions of contract.

In view of the situation an agreement was made and the FIDIC-Tsinghua University-CNAEC⁹ Training Center created on April 29, 2001 at Tsinghua, Beijing, for programmes and project management, with a main focus on the FIDIC Conditions of Contract. The proposed training programmes are designed to prepare and/or train the leaders in engineering-oriented project/programme management, consulting engineers and project managers. The training of project managers and construction companies' contract administration staff in the FIDIC Conditions of Contract and other contract documents is the starting point. Later the training will be extended to consulting and design professionals. The proposed training programmes will be open to participants from areas neighboring mainland China the same training needs are emerging as in the mainland.

The Center is located in the Tsinghua campus, in Beijing; it is run by representatives from CNAEC (the FIDIC member association in China) and Tsinghua University.

FIDIC guides, suggests and supervises the work and training plan of the Center; it recommends experts for the lectures, provides related documents and materials published by FIDIC (textbooks or reference books), and signs the certificates for the trainees that complete the courses.

For these reasons, the Chinese consulting and construction community has kept a close track of the development of FIDIC's standard forms of contract. The new suite of FIDIC Conditions of Contract became known in China almost immediately

⁹ China National Association of Engineering Consultants

after its publication in September 1999, and has been translated into Chinese, as authorized by FIDIC, by a panel recruited by CNAEC. The translation was published in May 2002 in Beijing.

Follow-up Activities of Chinese Academics and Practitioners to Promote Project Management

Chinese scholars and practitioners have been active in various ways, seeking to disseminate and promote modern project management knowledge and practice since the 1990s. A Project Management Research Committee was formed within the China Operations Research, Optimization and Mathematics for Economics Research Society in June 1991 in Xi'an, Shanxi province. The Committee is a body aiming to promote project management professionalism, and facilitate dissemination and sharing of professional information on both a domestic and international basis. The membership of the Committee encompasses the individuals and bodies involved in project management, both academically and practically, across various sectors.

The Committee publishes a half-yearly journal entitled *Project Management*, beginning in 1993. It has held a number of national or international symposiums or seminars since 1991. The Committee is interested in events held by the international project management community. The Secretariat staff has represented the Committee in a number of the IPMA annual conferences since the committee became a member of IPMA in 1996.

The committee also produced a document entitled *China's Project Management Body of Knowledge* in 2001. However, perhaps due to insufficient promotion efforts, the Committee has not become as generally known as would be desirable.

At the proposal of a group of researchers, professors and government officials, the State Economic and Trade Commission of China, in February 2001, launched a project to develop a document that can be used as guidelines for project management professionals to prepare for the certification examination that is expected will be required in a few more years in China. This document is also to serve as a common lexicon within the project management community in China for talking, writing and communicating with the international community about project management. The drafting panel is made up of researchers and professors of the China Academy of Science and a number of major universities in Beijing. The terminology, wording and organization of the document to some extent follows the PMI's PMBOK Guide. It is certainly true that the current economic and social circumstances of China have been taken into account during the drafting of the document. Comments and remarks were invited nationwide and across sectors several times. The finalized document was published in April 2002 entitled *Outline of Project Management Body of Knowledge in China*.

In order to further promote and raise awareness of project management needs, and facilitate professional capacity building in all sectors of China's economy, the

State Economic and Trade Commission, China Academy of Science, the State Administration of Foreign Experts Affairs and UNIDO sponsored the First International Conference on Project Management of China 24-26 April, 2002. Both international and domestic project management communities and other interested people responded to the call for papers very actively. Over 730 people either individually attended or represented their organizations at the conference. They also attended the seminars offered during the Conference.

The Chinese and foreign keynote speakers, without exception, pointed out that effective project management is the key for China's economy to grow healthily and smoothly. The conference has demonstrated that project management is an attractive and promising profession in China.

Project Management Education and Training in China

Construction project management as a management discipline is offered at both graduate and undergraduate levels in a number of major universities such as Tongji University at Shanghai, Tianjin University at Tianjin, Harbin University of Technology at Harbin, Chongqing University at Chongqing and Tsinghua University at Beijing.

However, Project Management per se has not been accepted by the Ministry of Education as a management discipline, either at undergraduate or graduate levels. As a result there is no university that offers formal project management education.

On the other hand, there have emerged numerous private firms that offer project management training services in several major cities such as Beijing, Shanghai, Shenzhen and Chongqing since 2001. The background for this is that more and more private businesses, especially the Chinese subsidiaries of major multinational firms, have realised that effective project management is essential for implementing their business strategies. They encourage and financially support their employees to attend project management training. Since the formal educational institutions could not provide such training services, profit-driven private firms take full advantage of the market needs. Their approach to meet the training needs is to form a kind of joint venture with major universities. They advertise for participants to enroll in their courses, and invite professors and sometimes project management practitioners to deliver lectures to the participants. The training is carried out on a part-time basis in most cases, usually on weekends. Most of the participants are satisfied with the training courses and make positive comments.

Notably, the University of Management and Technology of Arlington, Virginia, USA, has entered the training market in China. It formed a joint venture with Peking University and offered a project management programme at graduate level leading to a master's degree in 2001. Forty-eight persons from various businesses in Beijing have participated and finished their course work, and are now proceeding with their thesis work. On completion of their work, they will submit their thesis to a panel for appraisal.

Contract Law in China

One of the key factors for construction project management to be successful is the proper allocation of risks, rights and obligations risks among the principal parties to the contract, i.e. the employer and the contractor. The forms of contract are, therefore, prime tools to achieve the project objectives. The National People's Congress ratified the Contract law of the People's Republic of China on 15 March 1999.¹⁰ This law governs all the contracts entered into within China's boundaries. Chapter 16 of the Contract Law covers the contracts for building and civil engineering works.

The following is a discussion of the various aspects of contract and construction project management in China.

Standard forms of contract

As described earlier, the FIDIC conditions of contract are used for works of civil engineering construction and for mechanical and electrical works financed by the World Bank and the Asian Development Bank. The concept and principles of the FIDIC form have been accepted and used in construction projects by the construction industry in China. The FIDIC conditions of contract as such, however, have not been used for construction projects that are not financed by the international financial institutions. Instead, the central ministries of China have produced their own standard forms of contract for the domestic construction projects.

Prior to 1991, there were no standard forms of contract in China for construction and the supply and erection of plant. The MOC and the State Administration for Industry and Commerce jointly produced and published a standard form of contract for works of building construction in November 1991, the *Model Conditions of Contract for Works of Building Construction* (GF-91-0201).

After eight years in use, the GF-91-0201 has been modified, revised and renamed by the same agencies. The updating was started in 1997, based on feedback from the users, with reference to other standard national and international conditions of contract, such as FIDIC's, and the requirements of the laws on Construction, Contracts, Tendering and other laws enacted up to date. The revised document, the *Conditions of Contract for Works of Building Construction* (GF-1999-0201), was published on 24 December 1999. The revised edition comprises three parts: Part I-Form of Agreement, Part II-General Conditions and Part III-Conditions of Particular Application. Part III prevails over Part II and comprises amendments, additions and details required to modify Part II.

In addition to the *Conditions of Contract for Works of Building Construction* (GF-1999-0201), the other central ministries have also prepared and published the standard conditions of contract for the works of civil engineering construction under their supervision. For example, the Ministry of Water Conservancy, the

¹⁰ Contract Law of the People's Republic of China, enacted by the Second Session of the Ninth National People's Congress on March 15, 1999.

Ministry of Electricity and the State Administration of Industry and Commerce jointly prepared and published the *Conditions of Contract for Works of Hydraulic and Water Conservancy Engineering Construction* in September 1997. The Ministry of Communications produced and published the *Model Domestic Bidding Documents for Procurement of Highway Works* in November 1999. The conditions of contract included in the model bidding documents are, by and large, similar to FIDIC's Red Book, Fourth edition, of 1987.

Contractual relationships

In China, a main contract is entered into between the employer and the construction company as the general contractor. However, various other contractual relationships are established in addition to the one that exists between the parties to the main contract. Some of these will be mandatory, as required under the terms of the main contract, and others will be optional. These relationships are described in the following paragraphs.

Contractual parties to the main contract

Under the *Conditions of Contract for Works of Building Construction* (GF-1999-0201), the duties and/or obligations of both parties are specified as follows:

Contractor's obligations:

- Prepares working drawings as required by the employer and at the employer's cost if the contract expressly so provides, and submits them to the Engineer for approval (clause 9).
- Submits programme and progress reports to the Engineer (clause 9).
- Provides site office and accommodation to the employer at employer's cost (clause 9).
- Has regard for the safety and security of persons and property, keeps the site in an orderly condition, and protects the environment (clause 9).
- Takes care of the works (clause 9).
- Executes and completes the works as specified in the Contract.
- Remedies any defects in the works (clause 34).
- Carries out the commissioning of the works (clause 19).
- Submits any claims to the employer within a reasonable time (clause 36).
- Provides necessary insurance (clause 40).

Employer's obligations and duties:

- Appoints the Engineer (construction supervisor) (clause 5).

- Gives possession of the site (clause 8).
- Supplies site and soil investigation reports (clause 8).
- Obtains all permits (clause 8).
- Hosts a meeting to brief the design of project (clause 8).
- Makes payments (clauses 24, 26).

Subcontractors

Where the employer or the construction company employs others to carry out a part of the works, they are said to subcontracting out the works, that is, forming separate subcontracts to the main contract by retaining the services of subcontractors and/or suppliers. Under Clause 38 of GF-1999-0201, the main contractor may subcontract out part of the works as specified in the accepted tender and the agreement entered into between the parties. A copy of the subcontract must be submitted to the employer. The main contract prevails if there is an inconsistency between the main contract and the subcontract. The subcontract does not relieve the main contractor from any liability or obligation under the main contract.

Non-contractual parties to the main contract

Under form GF-1999-0201, the designer and the engineer involved in the design and supervision of the works are not parties to the main contract. Each has his own contract with the employer. Often such conditions of employment set out fee scales. As none of the aforementioned is a party to the main contract, they are not entitled to alter, in any way, the terms of the main contract itself.

Contractual arrangements

Contract arrangements in China fall into three broad categories, depending on the means of arriving at the contract sum: lump sum contracts, measurement contracts, and cost reimbursement contract.

- Lump sum contracts — In a lump sum contract, the contract sum is agreed in advance, subject to possible increases or decreases as a result of variations instructed by the architect/engineer in accordance with the contract. The sum agreed upon may be fixed, or adjustments may be allowed for fluctuation in the cost of labor and/or materials due to inflation during the contract period.
- Measurement contract — In a measurement contract, the contract sum is ascertained by measurement and valuation related to bills of quantities or to a schedule of unit rates included in the bidding documents.
- Cost reimbursement contract — In a cost reimbursement contract, the amount to be paid is determined on the basis of the actual cost incurred by the construction company in carrying out the works. An agreed amount is added to

cover overheads and profit. This is used where the requirements are only known in general terms because of the nature of the work, such as repair of damages, and/or because of an acute shortage of time. There are a few variants: cost plus percentage, cost plus fixed fee, cost plus fluctuating fee and target price.

Dispute settlement procedure

The disputes that arise between the employer and the construction company (contractor) can be resolved in various ways in China. Disputes Review Boards (DRB) or Disputes Review Experts (DRE) have been used for the projects financed by the World Bank, such as the Ertan Hydropower Station in Sichuan province.

At present, other dispute resolution methods are available to the construction industry in China, including mediation, DRB, amicable settlement by negotiation, arbitration and litigation. For example, GF-1999-0201 provides under Clause 37, Disputes:

“Sub-Clause 37.1 If a dispute arises between the Employer and the Contractor during currency of the Contract the matter in dispute may be settled amicably between the parties or referred to the authorities that have jurisdiction over the matter for mediation. If either party or parties are not willing to resolve their dispute as above or the dispute cannot be resolved as above the parties may agree an alternative resolution method and include it in the Part III-Conditions of Particular Application.

Alternative 1: the parties agree on arbitration and refer the matter in dispute to the arbitrators appointed by them.

Alternative 2: sue to the people’s court of law that has jurisdiction over the matter.”

However, in many cases the aggrieved construction companies will not offend the employer, even if they are in a favorable position in connection with the matter in dispute. The reason behind this is that the employers control the construction market, since there are many more construction companies than are actually needed at present in China. On the other hand, the majority of the employers have a government background, directly or indirectly. If any construction company dares to sue against the defaulting employer it puts itself at risk of greater trouble and even losing future opportunities.

Construction Joint Ventures in Asia — Lessons Learnt

Lu Youjie and Tan Wee Teck

Introduction

The nineties have brought renewed interests amongst western companies in the Asian construction market. Until the Asia financial crisis in 1997, Asia was the focal point of the international construction community. One Asian country after another pursued economic liberalisation policies that attracted foreign direct investments. Riding on the back of the foreign direct investments, the region enjoyed a long spell of boom construction.

The economic setback since 1997 has dampened international interest in Asia, but given the large infrastructure and housing needs of the continent, interests in the Asian construction market will be sustained for a long time to come. The economic revival of some of the Asian economies following the disastrous September 11 terrorist attack in US bears testimony to the long-term potential of major Asian economies like the Southeast Asian countries and China, including the Hong Kong Special Administrative Region and Taiwan.



The tallest building in the world, the Petronas Twin Towers in Kuala Lumpur, capital city of Malaysia. The towers were built by a consortium of Japanese, South Korean and Malaysian contractors.

Asian Construction Companies

Asia is a large continent with many countries in various stages of economic development. With the exception of Japanese and South Korean contractors, most contractors in Asian countries are in the developing stages. The State-owned Chinese contractors have good technical capabilities, but lack financial and management resources to undertake international projects at the present time. Until now the experience of mainland Chinese contractors outside their own country has been mainly on direct aid projects funded entirely by the Chinese government.

Asian construction firms, except for Japan, South Korea and China, are largely family-owned and managed. Family-owned companies are cost driven and are rarely competitive outside their own country. However, several large Malaysian, Thai, Singapore and Hong Kong companies have broken into the international market, led by second generation managers who have the benefit of a good western education. Chinese construction companies have also begun to compete in the regional markets.

Joint Ventures

Joint ventures are a popular form of business collaboration, more so in the construction sector because this sector is very heavily protected by many host countries. Often government authorities make joint ventures with domestic enterprises a precondition for foreign companies to win local construction projects.

As international joint ventures gain in momentum, however, voices of experience urge caution: “Joint Ventures are dangerous” ... “Your partners will take your technology and know-how and you will never see a profit” ... “The whole thing fell apart and we spent years sorting out the mess”.

Cooperation where carefully crafted and managed is an excellent business strategy. While words of caution should be heeded, they need not block greater use of cooperative business arrangements. Instead past experiences, both positive and negative, should serve to guide future joint ventures away from the rocky shoals of insufficient business and financial planning, incompatible objectives, poor partner selection, lack of management continuity and costly disputes, to a well-navigated course for a clearly defined, mutually beneficial association.

General Characteristics of Joint Ventures

Joint ventures can be broadly classified into three categories.

1 Professional and Professional Joint Venture — This form of joint venture is characterised by alliances of equals in management, financial and technical capabilities. Most international firms and some leading local Asian firms come under this category of partnership.

LKN Construction Pte Ltd (Singapore) and Aoki Corporation of Japan formed a Joint Venture to undertake three elevated urban rail contracts in Singapore from 1985 to 1989. Aoki is a very experienced contractor and LKN matched their foreign partner’s expertise by providing top-quality local staff led by their Managing Director to complement the Japanese team. All three contracts were very successfully completed and both partners were so satisfied with their respective performances that they continued to work together to bid for many more projects in Singapore.

2 Professional and Amateur Joint Venture — This is a common occurrence where the international firm generally has strong all-round capabilities that the local partner is not able to match.

Some clients especially government agencies in the developing countries try to reduce the technological and management gaps between the local and foreign partners by introducing technology transfer clauses in their contracts. In the early phases of the Mass Rapid Transit contracts in Singapore, the Singapore MRT Corporation made provision for technology transfer in their contracts and even set up a Technology Transfer Department staffed by a Senior Manager to

monitor the transfer process. The Singapore contractors did not appear to really benefit from this process. After some twenty years of MRT construction in Singapore, most major MRT contracts in Singapore are still clinched by foreign-led contractors.

- 3 Amateur and Amateur Joint Venture — This form of joint venture occurs when a seemingly professional international party sends a third-rate team to lead the joint venture team. Naturally in most cases, the local partner is inexperienced in the handling of major projects. This type of joint venture is fraught with violent quarrels amongst the partners, litigation and eventual termination of Joint Venture.

A Singapore consortium of contractors teamed up with three Belgian contractors to successfully secure the two Singapore MRT contracts. Under the joint venture terms, the foreign parties were supposed to provide experienced staff to the joint venture. However, the local party later discovered that the foreign managers provided by their partners had neither the necessary experience nor commitment to manage the projects. This led to severe delays and cost over-run. After several reprimands by the client, the joint venture eventually replaced the Project Manager with a very able expatriate Manager, together with the replacement of some key expatriate staff, and the project was subsequently completed.

Issues in Asian Joint Ventures

From interviews with major western and Japanese contractors operating in the region and our personal experience we have identified three key issues with joint ventures: management control, technology transfer and the keen interests amongst Asian construction firms to act as sub-contractors to the joint venture.

Management Control

In an ideal joint venture, the management control and strategic decision making are shared by both partners. However, in practice the local partner is often a 'sleeping partner' and the foreign partner becomes the final decision-maker. The absence of one partner in the decision-making often leads to discontent. A leading state-owned Chinese contractor found that when they joined the venture they lost their independence; they could not make any decision and had nothing except the legal position in the company.

Under a centrally-planned economic system, almost all decisions are guided by the Government or Ministries, or high-level organizations. Responsibilities are often taken by a group of leaders, not by the manager. However, the preferable leadership style for decision-making in most companies is usually consensus-based. Foreign managers are often very decisive; they want to be the only decision-maker in the joint venture. The choice of an appropriate style of leadership for the different levels of management is crucial for the joint venture's success.

In the case of family-owned Asian construction firms, the owners are used to having submissive managers under their employ and they are not used to trusting

non-family members. When faced with independent-minded expatriate managers from their joint venture partners, these owners often cede management control and then become unhappy.

Technology Transfer

In any joint ventures between international firms and local firms, the local partners invariably want to have access to their foreign partner's technology. The local partner may achieve this goal by driving hard bargains in their Joint Venture Agreement, requiring the foreign counterpart to effect technology transfer. This is sometimes aided by clients, particularly government clients, who stipulate technology transfer requirements in their international contracts. For example the Singapore Mass Rapid Transit Corporation incorporated technology transfer clauses in their earlier contracts.

Compared with Japanese and South Korean firms, European and American firms are more ready to share their technological know-how. However, for success, the technology transfer process requires the cooperation of two parties — one party to give and another party to receive the technology. In reality, few Asian firms have really benefited from the technology transfer process in the construction sector.

The Singapore Mass Rapid Transit projects have seen about 30 joint ventures formed in the last twenty years, but to date very few Singapore firms have developed the necessary technical skills to undertake MRT projects on their own. They are still dependent on the foreign counterparts to lead the consortia in the current phase of MRT contracts. One major impeding factor is that most Asian professionals are impatient for success. The good local professional staff find they are quickly moved to management positions because of the dearth of good professionals in most developing Asian countries. During the construction boom the problem was exacerbated by the shortage and the relatively fast turnover of managers, with key decision-makers on both sides probably being replaced every three to five years.

Partner as a Sub-Contractor

If they lose management control to their joint venture partners, most Asian companies fight hard to get back into the 'game' by sub-contracting the simpler structural, geotechnical and architectural finishing works.

The Singapore MRT contract works demonstrate the high level of sub-contract work that the local partners secured in their joint ventures. The foreign joint venture partner may frown upon this rather unusual arrangement, but in the interest of maintaining harmony, most joint venture management give in to their local partners. The JV Project Manager can find it difficult to manage sub-contractors who are also JV Partners since, in many cases, the local partners place their self-interests above the joint venture's interests to the detriment of the project.

Critical Success Factors in Joint Ventures

A successful joint venture can be defined as a “stable, healthy and profitable business relationship that meets the needs of both partners”. Critical success factors are well known to existing players, although they may not be so evident to others, including potential new entrants. Identification of these factors is a very difficult task.

Through a literature review and an overview of the many joint ventures in Singapore, Hong Kong and Malaysia, potential factors relating to the success of joint venture can be identified, including partner selection, negotiation and management control of joint venture’s operation.

Partner Selection

Joint ventures often involve very complex issues concerning the external environment, especially the legal and the political environment. The selection of an appropriate partner is critical to the success of a joint venture. If the partners do not understand each other well, the venture may be a disaster. Partner selection is also important to performance since it influences the mix of skills and resources that will be available to the venture and the joint venture’s ability to achieve its strategic objectives.

One of the most successful partnerships we have experienced was the Sato Kogyo-Maunsell partnership in the design-and-build Singapore East Coast Parkway elevated highway project from 1977 to 1982. The key success factor was attributed to the great care the Japanese main contractor exercised in the selection of key personnel from the British consulting firm. At the tender stage, the Japanese contractor flew a large team of engineers to London to select all the key design personnel, which involved detailed interviews, setting out detailed scope of work and specifying duration of services required for the key staff. The tender was successfully secured and the execution of the project went very well despite the cultural and language differences, not to mention the geographical distances.

The project was located in Singapore, with major designs being done in both Tokyo and London. It is noteworthy here that even at a time when the fax machine was still at a stage of infancy, a major project could be accomplished by a team of engineers working in different parts of the world!

Negotiation

Joint Ventures differ from other forms of collaboration because they require significant trust and negotiation. At start up joint ventures must address many issues:

- joint venture duration;
- capital contribution;
- labour and social issues;

- financial management;
- settlement of disputes; and
- conditions for termination.

All of these can be negotiated and improved to reduce the difficulties of doing business. Good negotiation can increase the efficiency of establishing a joint venture.

The main objective in negotiations is to determine the legal arrangements that best satisfy the venture partners. Obviously one cannot expect to find a structure that will satisfy all the objectives of the partners. An optimal joint venture can be well-developed only by analysing the situation carefully and in detail.

In most parts of Asia where the legal framework is still not mature, the negotiation process becomes more difficult. In addition, most Asian managers, who are directly involved in the negotiation process, have insufficient skills and expertise required for efficient negotiation, such as an understanding of the laws. Experienced foreign partners who are successful negotiators in other countries, may find it difficult to negotiate in joint ventures in developing regions in Asia such as China and Vietnam. The key to success here is an understanding of the local customs and the people as well as overcoming cultural barriers. These are tremendous obstacles for business people doing business in a foreign country whose culture and language are different from their own. Here are two examples that illustrate the importance of the negotiation process to the success of a joint venture as a whole:

- A large Chinese state construction enterprise wanted to come to Singapore to form a joint venture with a Singapore firm to undertake a major construction project, but the negotiation almost fell through when the Chinese partner wanted the Singapore party to guarantee that his mainland Chinese workers could obtain the necessary work permit from the Singapore government to work at the sites. As Singapore is a free economy, private firms have no influence on government policy — unlike the Chinese state-owned enterprises. The Singapore party could only promise to try to assist in the application for the work permits, but could not offer any guarantees. Eventually, the Chinese party went ahead with the joint venture only after lengthy deliberations on the subject, at times reaching the point where both parties almost broke off the negotiations.
- A joint venture between a group of three Singapore companies and a western consortium of contractors, comprising two European and an American firm, were constructing a major underground road project in Singapore in the eighties. Shortly after the commencement of the project, the joint venture discovered a major mistake in the tender price. The local partners, who were counting on the expertise of their foreign partners to price the contract, withdrew from the project. The western consortium proceeded to complete the project at great financial loss. The litigation that followed took many years to resolve.

Management Control In The Joint Venture (JV)

Selecting the ‘right partner’ and having very good negotiation skills and a stable and favourable business environment do not guarantee success. The day-to-day management of a joint venture is a fundamental issue. In operating a joint venture, problems happen in almost all the phases of management, like decision-making, communication, changing organization structures, and so on.

Decision-making Process

East-Asian managers are guided by Confucian values, which emphasise stability of society, harmony in family, and virtuous behaviour towards others. Asians are group-oriented and personal-relationship oriented, whilst western management is generally individualistic and result-oriented. This clash of management style often results in less-than-happy partnerships. With growing experience in joint ventures and more careful selection of JV Management staff, the gap has narrowed considerably over the last few years.

Mutual Understanding of Cultures

Joint ventures require sensitivity to different cultures. Foreign companies should provide language and cultural training for managers who will be working in the host country.

Mutual understanding of different cultures helps improve the partner relationship, avoid conflicts and thus supports the success of a joint venture. Part of the cultural difference is the way people do business differently. Foreign managers should keep in mind that forcing a change in local customs and practices is not beneficial, practical or productive, because the Asian market has inherent characteristics.

Trust is highly respected in doing business, especially in Asia. Many joint ventures were dissolved because the local partner discovered that their foreign partner played tricks on them. Complaints of local managing partners of joint ventures include the buying of second-hand and out-dated machinery that was of poorer quality and more expensive than that available locally, and partners colluding with their foreign suppliers.

Communication in the joint venture

Communication is especially important to any joint ventures, particularly where language barriers add difficulties to the relationship between the foreign managers and the local workers. Efficient communication within a joint venture is important to ensure accuracy, quality and timeliness of information, which leads to everyone understanding the business they are doing. Success can never be guaranteed, but recognising the critical factors is always a significant help.

The Golden Rules of Partnership Management

Managing joint ventures is notoriously difficult; however, they can be made to

work if a company approaches them in the right way. In numerous discussions, with both Asian and western firms, the following principles of partnership management were identified.

Plan Thoroughly

Whilst it may not be possible to write the same kind of operational plan for a partnership that you can for a wholly-owned business, certain planning procedures, can, and must, be followed if the desired goals are to be reached:

- prepare an outline of the activities undertaken within the partnership and the resources required;
- agree on the staff recruitment criteria; and
- plan how the relationship is to be structured and managed to obtain optimum benefit.

Accommodate Cultural Differences

The potential for cultural conflict abounds in joint ventures. Conflict can arise in a number of different ways. There are differences between large and small company management styles, differences between national business cultures, and differences between established management styles of individual corporations.

Large companies tend to have complex structures with multiple tiers of management, and they tend to have established procedures for making management decisions. There are usually many different groups with an interest in any given project, slowing down decision-making. In small companies, where regular day-to-day contact between employees makes informal communications the norm for exchanging information, decisions can be made quickly by just one or two people.

In a Singapore MRT contract awarded recently, the client required the European partner of a three-party joint venture, including a Chinese and a Singapore firm, to submit a Guarantee to the Authority, whereby the European firm is bound to complete the project on behalf of the joint venture in the event of any of the other partners in the joint venture not being able to complete the project. This requirement by the Authority was a precondition for the Award of the Contract. The joint venture partners had little choice but to comply with the Authority's requirement. In turn the European firm required the other joint venture partners to provide a Counter Indemnity, which they duly obliged. However, the European firm's legal adviser later required the Chinese party to have their Counter Indemnity endorsed by the Chinese government because Guarantees given by Chinese companies are not enforceable in China unless otherwise registered with the Chinese Government. The Chinese partner was offended and took the requirement of their European partner as a lack of trust. The European firm's legal officers stood by the legal position. It took several months before the issue was resolved.

The legal department of the European firm and some of the ‘hawks’ in the European firm’s head office were eventually persuaded to relax on the terms and the Chinese party, after much persuasion finally registered the Guarantee with their government.

Establish Clear Strategic Leadership

Clear leadership is essential in any business or project, and one of the most important aspects of structuring a strategic partnership is choosing the right leader. Ineffective leadership makes coordination difficult and expensive; it slows down development, and it can make it virtually impossible for important decisions to take effect.

One way of creating strategic leadership is to have one of the partners take on the role of project management. This is the easiest solution in major projects, requiring the integration of complex inputs from many partners.

A consortium of Ways and Freytag of Germany, Econ International (Singapore) and Chew Eu Hock (Singapore) won a design and construct contract from the Singapore Land Transport Authority, for a complex elevated roadway and subway rail tunnel for the Singapore Mass Rapid Transit North East Line in 1997. The Project Manager for the consortium was provided by Ways and Freytag. He was a very strong technical manager with many years of working experience in Asia. He won the trust of his Singapore partners with his leadership and the local partners left him to manage the complex project to successful completion recently.

Learn Flexible Management

Companies involved in joint ventures must learn how to manage without the kind of control to which they are accustomed. The degree of influence a company has depends very much on the type of partnership and on the power balance existing between partners. For example, a minority partner in a company that is doing well has little or no influence over its management. On the other hand, a company that is doing badly, and in need of capital, must listen carefully to its partner.

Companies involved in joint ventures must be flexible. Their managers must be both diplomatic and astute. Companies must ensure all members of their team understand the importance of working with the other partner constructively. At the same time, the limits of co-operation must also be clear; sensitive information must be identified and isolated.

In 1996, a Singapore contractor and a Chinese contractor formed a joint venture to undertake construction of 625 dwellings in a public housing project comprising four 20-storey apartment blocks and two 16-storey apartment blocks. The Chinese company initially had the controlling share of 70%. The Chinese contractor was to provide all the supervisory and labour personnel for the contract with the Singapore party providing project management, administration and quantity surveying services.

Shortly after the commencement of the contract, the Chinese party encountered

difficulty in getting Employment Passes for their professional staff to work in Singapore. Their workers were also not able to obtain the work permits to work because the local partner was unable to meet the Singapore government quota of one local worker for every five foreign workers. The local partner did not have enough local staff to earn the 'quota' for his Chinese counterparts to bring in his workers. Both parties were able to reconcile the differences. The Chinese party reduced their shareholding in the Joint Venture. More of the work was sub-contracted out to other local firms and the problem was circumvented by the flexible response of both partners to the problem.

Learn From Your Partner's Strength

Every company has a different way of doing things. All companies can learn from others. Strategic partnerships offer the opportunity to observe how another company operates, for example how construction waste control is managed, how overseas subsidiaries are managed, and even how remuneration packages are determined.

Individuals involved in the joint ventures must be chosen for their receptivity to new ideas, as well as their ability to disseminate what they have learned throughout the organization. Internal seminars can be conducted to spread this knowledge and special programmes can be created to evaluate the relevance of this knowledge to the company's particular circumstances.

Viva la Joint Ventures

Singapore commenced construction of its rail-based mass-transit systems in 1983. As of Feb 2002, Singapore has about 100 km of operational heavy rail system. The northeast line, which is due to be opened by the end of the year, will add another 20 km of underground rail network to the system. More lines are being planned and built. As shown in Table 2, every phase of the MRT civil engineering works has included local and foreign joint ventures. There is a place for joint ventures in construction business and this form of strategic alliance is here to stay.

Conclusion

The pace of business innovation — not just technological innovation — is accelerating. So companies must focus on better ways of staying ahead, on being first to exploit new technologies and markets, and on continually finding new ways of reducing operating costs through partnerships.

No company can expect to have all the resources — technical, financial and managerial — to respond to this fast-changing environment quickly enough. Acquisition is too inflexible and too unwieldy a tool to achieve every business development objective.

Joint Venture offers an increasingly important response to this more complex,

Singapore MRT Projects	L/F JV	F JV	No JV	Total	Remarks
Phase 1 (1983 to 1989)	9	4	1	14	L/F : Local / Foreign JV
Phase 2 (1986 - 1990)	13	1	3	17	F JV: Foreign Firms JV
Woodlands Line (1990 - 1995)	2	1	2	5	
Airport Line (1998 - 2001)	2	1	2	5	
North East Line (1997 - 2002)	10	2	5	17	
Marina Line Stage 1 (2001 - 2006)	2			2	
Total	38	9	13	60	

Table 2: Singapore Mass Rapid Transit Projects civil engineering works contracts

more urgent and less forgiving competitive environment. However, there are many pitfalls for the inexperienced. It is often more difficult than managers first imagine to deliver the business benefits from situations in which control is split between two or more partners. Objectives and priorities can change over time. Nonetheless, we believe that collaborations produce winners and more so in the highly complex international construction arena.

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Worley's Project Risk Management

Patrick Tuohey

A: The Risk Management Process

Worley's Project Risk Management Process is based broadly on the Australian and New Zealand Standard for Risk Management AS/NZS 4360:1999, fast becoming an international benchmark standard in risk management.

In a formal workshop / brainstorming session, the key project players are assembled to identify the risks to the project's success. The process concentrates on a qualitative assessment of the project risks, and the development of a Risk Management Plan to manage and control these risks.

The process involves the following steps:

1 Establish the Context

- the formal description of the context under which the risk session will proceed; a written statement is agreed up-front by the players on the precise purpose of the session;
- the identification of the key stakeholders in the project - typically, the key stakeholders encompass a much broader group than the direct contract holders;
- the identification of key success factors (KSFs) for the project and of the needs of the key stakeholders - by definition, a risk is anything that impacts on these.

2 Identify Risks

- a brainstorming/'free-range' session in which all possible project risks are identified and logged, without reference to any evaluation criteria - an 'anything goes' forum;
- as a safety net under the brainstorming session, a series of key-word checklists are presented to the session to uncover additional risks.
- some of the possible sources of risk include:
 - commercial / contractual
 - management activities and controls
 - property / assets
 - socio-economic
 - technology / technical
 - security
 - political / legal / environmental
 - project execution / operational
 - natural events

- personnel / human behaviour
- business interruption
- public / professional / product liability
- financial / market
- occupational health and safety
- custody of information

3 Analyse Risks

- the risks identified are now categorised into broad ranges, based on a consequence-likelihood matrix against criteria - numerical ranges are used for both the consequence of a risk occurring, and the likelihood of it occurring.

4 Evaluate Risks

- the risk matrix provides a severity ranking of each risk into (a) extreme; (b) high; (c) moderate; and (d) low categories. Generally, extreme and high risks require immediate attention, while moderate and particularly low risks may be accepted without treatment.

5 Treat Risks

- for extreme and high risks, a treatment plan is established in order to mitigate the risk. Possible ways to treat risks include:
 - accept risk
 - avoid risk
 - reduce the consequence of occurrence
 - reduce the likelihood of occurrence
 - reduce both the consequence and likelihood
- as an outcome of the risk treatment plan, a risk action plan is agreed describing the required action, action parties and schedule for action completion.

6 Communicate and Consult

- the Risk Management Plan is communicated throughout the project team, to get buy-in and agreement.

7 Monitor and Review

- the Risk Management Plan becomes an on-going strategic project management tool, and is kept alive throughout the performance of the project..

B: The Risk Management Plan

The key deliverable from the Risk Management Process is a Risk Management Plan, which includes the following documents:

- Project Risk Map

- Stakeholder Risk Map
- Project Risk Register
- Risk Treatment Plan
- Risk Action Plan

These documents form part of the strategic project management process for the project, and must be communicated throughout the project and monitored, reviewed and updated progressively throughout the project life.

1 Project Risk Map

The Project Risk Map is a summary of the project risks categorised into the agreed consequence and likelihood of occurrence — the Worley process uses colour coding to allow easy identification of risk severities. Both before- and after-treatment risk maps are produced.

2 Stakeholder Risk Map

Though not a requirement of the standard, Worley uses the Stakeholder Risk Map to identify those stakeholders affected by each risk - even a low severity risk may require some attention if it can have a significant effect on government, local community, regulators, etc.

3 Project Risk Register

This is the register of project risks identified by the Risk Management Process, and includes a brief description of the risk, its categorisation against the consequence and likelihood of occurrence, and the resultant risk severity.

4 Risk Treatment Plan

For each risk, a description is given of the way in which the risk may be treated. Options include the acceptance of the risk, the avoidance of the risk, or a reduction in the consequence and /or likelihood of occurrence of the risk

5 Risk Action Plan

An action plan is developed for each treated risk, giving a broad description of the action required, and optionally, the person responsible and the schedule for completion of the action.

In the Worley process, the Project Risk Register, Risk Treatment Plan and Risk Action Plan are combined into a single, colour-coded document. We find that this is far more user-friendly for the project team, and helps to ensure compliance with the process.

Examples of the Risk Management Plan documents are included in the following pages.

			Consequences				
			Insignificant 1 \$50,000	Minor 2 \$500,000	Moderate 3 \$5,000,000	Major 4 \$50,000,000	Catastrophic 5 \$500,000,000
Likelihood	A (almost certain)	95%					
	B (likely)	80%			15 16	1	
	C (moderate)	50%	41	27 28 29 32 34 35	3 4 5 7 8 9 10 18 19	2	
	D (unlikely)	20%	43 47 49	36 39 40 42 45 46 48	20 21 22 24 25 30 33	14 17	
	E (rare)	5%	38 44	37	23 26 31	6 11 12 13	

Extreme risk High risk Moderate risk Low risk
LEGEND: [Black box] [Dark grey box] [Medium grey box] [Light grey box]

No	Description	Treatment	
		Before	After
1	Losses due to increased gas price if Desal Plant not on time	[Black]	[Dark grey]
2	There is a gap between salvage value assumed and finally liquidated amounts	[Black]	[Dark grey]
3	Failure to deliver electricity at required reliability	[Dark grey]	[Dark grey]
4	Failure to deliver electricity within contract schedule	[Dark grey]	[Dark grey]
5	Failure to have regulatory approvals in place to meet contract schedule	[Dark grey]	[Light grey]
6	Client unilaterally exercises rights of early termination	[Dark grey]	[Medium grey]
...
15	Interest fluctuations between now and 'final closure'	[Dark grey]	[Dark grey]
16	Corrosion in plant (particularly gas turbine air intakes) due to salt water spray	[Dark grey]	[Dark grey]
17	Errors in financial model	[Dark grey]	[Dark grey]
...
19	Uncertainty in OPEX estimate	[Dark grey]	[Light grey]
20	No guaranteed MCD	[Dark grey]	[Light grey]
21	No guaranteed total energy sales	[Dark grey]	[Light grey]
22	Failure to deliver electricity of required quality	[Dark grey]	[Light grey]
23	Failure to deliver electricity at required quantity	[Dark grey]	[Light grey]
...
35	Failure to meet noise regulations	[Dark grey]	[Light grey]
36	Client 'steps in' to ensure plant reliability	[Light grey]	[Light grey]
37	Failure by client to pay its bills	[Light grey]	[Light grey]
38	Principal is unable to get back-to-back liabilities with Vendor	[Light grey]	[Light grey]
39	Principal is unable to get back-to-back liabilities with gas supplier	[Light grey]	[Light grey]
40	Client requires us to obtain 'business continuance insurance'	[Light grey]	[Light grey]
41	Principal has little experience in plant operations	[Light grey]	[Light grey]
42	Failure to meet NO _x regulations	[Light grey]	[Light grey]
...
47	Loss and delay due to inclement weather	[Light grey]	[Light grey]
48	Requirement for load bank testing	[Light grey]	[Light grey]
49	Ground conditions in proposed site require additional time and money	[Light grey]	[Light grey]

Figure 1: Sample Project Risk Map

		Stakeholders Affected by Risk						
No	Risk Description	Community/ Government	Regulators	Client	Principal	Main Vendor	Other Contractors	
1	Losses due to increased gas price if Desalination Plant is not on time			✓	✓			
	There is a gap between salvage value assumed and finally liquidated amounts				✓	✓		
3	Failure to deliver electricity at required reliability	✓		✓	✓	✓		
4	Failure to deliver electricity within contract schedule			✓	✓	✓	✓	
5	Failure to have regulatory approvals in place to meet contract schedule		✓	✓	✓	✓		
6	Client unilaterally exercises rights of early termination	✓		✓	✓	✓		
7	Losses due to late delivery by Vendor				✓	✓	✓	
8	Losses due to late delivery of gas supplier				✓	✓	✓	
9	Client forces change of scope			✓	✓	✓	✓	
10	Foreign exchange exposure for procurement of up-front plant				✓	✓	✓	
11	Default by Principal during EPC phase			✓	✓	✓	✓	
12	Class action by 3rd parties (eg loss of power, environmental damage, etc)			✓	✓	✓	✓	
13	Currently undefined penalties (to be negotiated) are not 'in full and final settlement'	✓	✓	✓	✓	✓	✓	
14	Contract liabilities are currently uncapped			✓	✓			
15	Interest rate fluctuations between now and 'final closure' (note 18 year interest rate is fixed?)				✓			
16	Corrosion in plant (particularly gas turbine air intakes) due to salt water spray			✓	✓	✓	✓	
17	Errors in financial model				✓			
18	Uncertainty in CAPEX estimate				✓			
19	Uncertainty in OPEX method				✓			

Extreme Risks

High Risks

Figure 2: Sample Stakeholder Risk Map

No	Risk Description	Risk Severity before Treatment			Risk Treatment Plan	Action Plan	Risk Severity after Treatment		
		Likelihood	Consequence	Risk Severity			Likelihood	Consequence	Risk Severity
1	Losses due to increased gas price if Desalination Plant is not on time	Likely B	Major 4	Extreme	Avoid risk	<ul style="list-style-type: none"> • negotiate with gas supplier/Client/government • walk away from contract before financial closure 	Unlikely D	Minor 2	Low
2	There is a gap between salvage value assumed and finally liquidated amounts	Moderate C	Major 4	Extreme	Reduce likelihood and consequence of occurrence	<ul style="list-style-type: none"> • obtain buy-back prices from Vendor and use in model 	Unlikely D	Moderate 3	Moderate
3	Failure to deliver electricity at required level	Moderate C	Moderate 3	High	Reduce likelihood and consequence of occurrence	<ul style="list-style-type: none"> • incorporate into design specification • back-to-back liabilities with Vendor • build (n-1) redundancy into system • closely train operations and maintenance personnel 	Unlikely D	Minor 2	Low
4	Failure to deliver electricity within contract schedule	Moderate C	Moderate 3	High	Reduce likelihood and consequence of occurrence	<ul style="list-style-type: none"> • back-to-back Liquidated Damages with Vendor and gas supplier • negotiate Liquidated Damages • negotiate end date 	Moderate C	Minor 2	Moderate
5	Failure to have regulatory approvals in place to meet contract schedule	Moderate C	Moderate 3	High	Reduce likelihood and consequence of occurrence	<ul style="list-style-type: none"> • seek regulatory approvals from time of 'preferred contractor' status until 'financial closure' 	Moderate C	Minor 2	Moderate
6	Client unilaterally exercises rights of early termination	Rare E	Major 4	High	Reduce likelihood and consequence of occurrence	<ul style="list-style-type: none"> • negotiate cost recovery for early termination in contract 	Rare E	Minor 2	Low
7	Losses due to late delivery by Vendor	Moderate C	Moderate 3	High	Reduce likelihood and consequence of occurrence	<ul style="list-style-type: none"> • back-to-back Liquidated Damages with Vendor • manage/build relationship with Vendor 	Unlikely D	Minor 2	Low

Figure 3: Sample Project Risk Register, Treatment and Action Plans

B

Appendix B

This section includes summary biographies of contributors to the book, and details of the organisations that supported the CAE Conference on *The Contract in Successful Project Management*, held in Christchurch New Zealand in February 2002.

Contributors



Sir Ian Barker

QC, LL.D (Hon), FAMINZ, FCIArb., Chartered Arbitrator

Sir Ian Barker is President of the Arbitrators' and Mediators' Institute of New Zealand. He is also patron of LEADR NZ, a chapter of the leading Australasian mediation organisation. He retired as a Senior Judge of the High Court in 1997 and is a member of the Courts of Appeal of Fiji, Samoa and the Cook Islands. He currently practices as an arbitrator and a mediator involving a wide range of commercial disputes.



Dr Martin Barnes

BSc (Eng), PhD, FICE, FCIQB, FAPM, FICES, MBCS, CIMgt, FREng

Martin Barnes is the Executive Director of the Major Projects Association, specialising in the human aspects of project management, contracts and risk management. He has been an independent consultant since 1996. He has been responsible for a number of developments in engineering and construction management techniques now widely used and was the principal author of the New Engineering Contract (NEC).



Dr Nael Bunni

BSc, MSc, PhD, CEng, FIEI, FICE, FStructE, FCIArb, FIAE, MConsEI

Nael Bunni is a Chartered Engineer, Registered Chartered Arbitrator and Conciliator. He is Past President of the Chartered Institute of Arbitrators, London, and of the Association of Consulting Engineers of Ireland. He has acted as conciliator, arbitrator or chairman of arbitral tribunals in disputes involving parties from over thirty countries. He is the author of a large number of papers and three books on contracts and insurance.



Professor John Burrows

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John Burrows is a Professor of Law at the University of Canterbury, Christchurch, New Zealand, and a visiting Fellow of Clare Hall, Cambridge University, England. His areas of interest are Media Law, Statute Law and the Law of Contract and he is the author or co-author of five textbooks on these subjects. He is currently a member of the New Zealand Government's Legislation Advisory Committee.



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David is a director of the risk management firm of Optimx Ltd and an Emeritus Professor of Civil Engineering at the University of Canterbury. He is particularly interested in the relationship between project contracts and risk management. He is a Fellow of the Royal Society of New Zealand and a Distinguished Fellow of the Institution of Professional Engineers, New Zealand.



Derek Firth

LLB, FAMINZ (Arb.), FCI Arb, Chartered Arbitrator (UK)

Derek Firth is a barrister, arbitrator, and a director and trustee of a number of companies and trusts. He has spent most of his professional life working on the legal side of the construction industry and has represented major construction companies in disputes in New Zealand, the Middle East, Alaska, Singapore, Hong Kong, Australia and the South Pacific.



Ernesto Henriod

CEng, MSc (Eng), Dip Mgmt., MCIP, FICE, FIPENZ, MDRBF, AAMINZ

Ernesto is a civil engineer experienced in consultancy, contracting, owner's representative in projects, and development banking. He worked for 18 years in the World Bank, in positions ranging from a leading role in procurement policy, to senior management. He is the author and co-author of books, papers and policy documents on construction and management. He is currently a consultant, particularly in dispute prevention or arbitration and mediation in civil engineering and building contracts. He is also Advisor to CAE and the Asia Construction Academy of Singapore.



Dr Jason Le Masurier

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Jason has recently been appointed as Senior Lecturer in Construction Management at University of Canterbury. He previously worked in the UK construction industry for eleven years, with equal time spent in academia and practice. He was recently a team member with the UK 'Movement for Innovation', which promotes best practice and innovative approaches to construction projects among clients and their supply chains.



Frank McDonough

PE, CEng, FICE, FASCE, MNSPE, MDRBF, MASPE

Frank is the CEO of the firm McDonough Bolyard Peck, which provides services ranging from engineering design, infrastructure rehabilitation, field inspection and project management services, to expert analysis of construction disputes. He has served as mediator in major contracts in the USA, as chairman or member of Dispute Review Boards for several projects, as an arbitrator, and expert witness in court cases. His international work includes projects in Bahamas, Nepal, India, Chile, and Saudi Arabia.



Gay Pavelka

FAMINZ, MIAPP, Accredited Mediator, Community Mediation Service, ChCh

Gay is established in private practice, having mediated in community, workplace and resource management disputes since 1984. She provides services to a range of clients, including school boards of trustees, regional, district and city councils, community groups and businesses, usually to prevent the development of conflict or to problem-solve in specific disputes. She undertakes cases of resource management and those involving non-environmental issues and has provided these services in New Zealand and in the South Pacific region.



Dr Patrick Tuohy

FIEA, FIChemE (UK), MAACEI (USA), CPE (Australia), CE (UK)

Patrick has over 20 years experience in the resources industry, the last 18 years in the engineering contracting industry where he has served in a number of key management, commercial and technical roles. He has been involved in some of Australia's largest resource industry projects, and has also held senior commercial and contract management positions with major engineering corporations. He is a Director of Worley, with direct responsibility for Worley Safety and Risk Management, the safety and risk consultancy group of the firm.



Tan Wee Teck

Dip Eng, Singapore Polytechnic; BEng (Hons) Strathclyde University

Wee Teck is currently Director of several engineering, construction and consultancy companies in Singapore, notably the Shanghai Tunnel Engineering Co (Singapore). He has experience working with Japanese and Chinese firms, and has served other Asian countries in the development of their construction industries, notably Sri Lanka. Wee Teck's experience has covered a wide range of functions in strategic planning, project management and construction.



Dr Suzanne Wilkinson

BEng (Hons), PhD

Suzanne has a civil engineering degree and a PhD in civil engineering from Oxford Brookes University, UK, specialising in construction management. She is currently employed as a senior lecturer in engineering management at the University of Auckland. Her teaching and research interests cover the areas of construction law, contract administration and project management.



David Williams

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David is a Barrister at Law and Arbitrator, with over 25 years' experience in commercial litigation and arbitration. He has extensive experience as an arbitrator and mediator in New Zealand commercial issues and disputes as Counsel or Arbitrator, and Counsel in numerous cases heard in the Privy Council, London. David is the New Zealand representative on the ICC International Court of Arbitration (Paris) and a member of the London Court of International Arbitration (LCIA), and is Vice-President of the LCIA Asia Pacific Council. He is Vice-President (Arbitration) and Fellow of the Arbitrators' and Mediators' Institute of New Zealand.



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Tim is Chief Engineer (Structures) for Cornwall County Council and Deputy Project Manager for the Tamar Bridge Strengthening and Widening Project. He manages a team of 45 who design, inspect and maintain 3700 highway structures. He has 16 years experience in civil engineering concentrating on bridges and contract administration/supervision.



Lu Youjie

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Youjie is a professor in the Department of Construction Management, and a co-Director of the Centre of Project Management Studies and Training of the Tsinghua University of Beijing. His research interests centre upon construction project management, systems engineering, building economics, project financing, and affordable housing. He has an active involvement in continuing education programs both within Beijing and abroad. Professor Lu is the author of 56 papers and 12 books on subjects of his fields of expertise.

Contributing Organisations



Centre for Advanced Engineering

The Centre for Advanced Engineering was built on a vision to broaden this country's technical knowledge for the benefit of all New Zealanders. This CAE has done consistently and successfully since its foundation in 1987. Today CAE is at the forefront of the application of engineering knowledge so as to develop new perspectives and solutions. As an independent non-partisan body, CAE is uniquely well positioned to perform the four roles of pioneer, integrator, knowledge broker and awareness raiser.

But it's not just about specialist knowledge. There's an art in getting people to come together and produce the right mix of energy and insight to find solutions to the issues of the day. Calling on academic and industry expertise, CAE are able to encourage and facilitate action on the emerging issues of the day. CAE distributes the newly-created body of knowledge through our website, seminars, conferences and publications.



The Arbitrators' and Mediators' Institute of New Zealand

AMINZ is the premier dispute resolution body in New Zealand. Its members include arbitrators, mediators, adjudicators, conciliators, facilitators and expert witnesses. The Institute is dedicated to promoting high quality dispute resolution services by its members to the public. The Institute is a major co-ordinator of dispute resolution education and its education programmes and professional qualifications are recognised internationally. It has close ties with many similar overseas organisations.



Project Management Institute New Zealand

PMI New Zealand is a chapter of the US-based Project Management Institute (PMI). It currently has 700 members, and is one of the largest chapters of PMI outside North America. PMINZ is very active in promoting professionalism in project management and runs and promotes courses in the Project Management Professional (PMP) qualification for all members. PMINZ is also active in working with other organisations in promoting the highest standards of professional project management.



The Institution of Professional Engineers New Zealand

IPENZ is the Professional Society for 8,000 professional engineers in New Zealand. IPENZ assesses competency of engineering practitioners, benchmarks and accredits New Zealand engineering qualifications, encourages and assists continuing professional development, and provides awards and scholarships that recognise achievement. IPENZ provides a widening range of membership services. IPENZ also represents engineers' interests with government, provides contact with other professionals through branches and technical groups, and maintains a vigorous publication and conference programme. IPENZ promotes public debate on engineering issues within the community, and seeks to contribute, on behalf of the engineering profession, to resolution of issues affecting the wider community.

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