Choosing the Best Contractual Strategy for the Construction of Major Projects

by Andrew Stephenson
Clayton Utz

1. INTRODUCTION

Contracts allow the risks associated with the construction of a major project to be transferred from the owner of the project to various counterparties for a price. In some cases extensive risk transfer is appropriate, notwithstanding the price. In other cases it is not. Choosing the appropriate contractual strategy requires consideration of a number of factors. For example if the owner intends funding the project by using project finance, then it should seek to allocate as much risk as is possible away from itself to a construction contractor, with a robust balance sheet. Such an approach will be favoured by the banks and may also allow the debt to equity ratio to be increased.

However for those funding the project with equity or corporate finance such an approach may not suit; particularly if the owner of the project has significant in house expertise. This is so because an effective **risk** transfer to a construction contractor usually carries with it a shift in **control** from the owner to the construction contractor. Owners with high levels of expertise may wish to have very high levels of control over the detailed design and methods of construction to ensure that the design will suit its preferred method of operation, have sufficient redundancy to ensure that the required level of reliability is achieved and that overall the whole of life costs are appropriate for the project. Where these owners have sufficient experience and expertise such an approach is likely to produce the best outcomes. The lowest risk is achieved by the owner taking control and dictating exactly what it wants. A good example of a project of this type would be the construction of a refinery by one of the major oil companies. Such companies have enormous internal expertise and experience. As a consequence of owning other refineries (and having been in the business for in excess of 100 years) they will be fully aware of the way in which they prefer their facilities to be operated. They also know the desired level of reliability and whole of life costs they want to achieve, having regard to the economic trade-off between capital cost on the one hand and operating costs and reliability on the other.

The loss of control is less important for those owners who do not have sufficient internal expertise and are therefore likely to be relying on the contractor's expertise to deliver the project to the required standard in any event. Such an owner usually also needs the comfort of a fixed price, fixed time contract to secure the funding of the project.

The examples discussed above are the extremes of the spectrum. In between those extremes lies a continuum of alternatives all of which are suitable for projects. The trick is to identify which is best for the specific project and then consider the state of the relevant market to see whether the contractors in that market are willing to contract on what the owner considers is the optimum risk allocation. To the extent that the market will not accept the owner's preferred risk allocation, it is necessary to tailor the approach to obtain the best risk allocation possible in the circumstances.

While the concepts are simple, they are abstract without a factual environment. Accordingly, this article considers the issues by reference to a number of generic contractual strategies. The first step is to identify the relevant risks and develop a risk matrix. **Attachment 1** to this article is a set of simple risk matrices for a process engineering project drawn from the owner's point of view, using the alternative contractual strategies discussed in this paper.

A "process" engineering contract is one that uses a chemical process. For example, a plant which converts lateritic ore into nickel and cobalt will use various chemical processes to affect the required extraction. This type of project has been chosen as there are likely to be a number of different contracts which will be entered into for the purposes of the project (irrespective of the common form of contract

used), dealing with different parts of the project and different risks. The common types of contract considered are:

(a) Traditional (see section 2)

(b) Engineer Procure and Construct (see section 3)

(c) Engineering Procurement and Construction Management (EPCM) (see section 4);

(d) Early Contractor Involvement / Managing Contractor (ECI) (see section 5); and

(e) Alliance Contracting (see section 6).

Each of these types of contracts produce a different "risk matrix".

The risk allocations under these methods of contracting are further discussed below in detail in **Part 1**.

Part 2 of the paper examines how proportionate liability legislation and how the ability to enforce the contract — against both domestic and international counterparties — can affect the risk allocation agreed between the parties. Obviously it does not matter how well the contract is drawn or how complete is the risk transfer if the contract cannot be enforced in an economical way. Accordingly to protect the value of a well-drawn contract, that contract must have appropriate drafting to deal with proportionate liability and enforcement.

Finally, **Part 3** provides a conclusion.

PART 1 — CONTRACTUAL RISK ALLOCATION

2. Section 2: Traditional

The traditional form of contract requires the owner to engage a design consultant to prepare a detailed design of the proposed project prior to the owner engaging the construction contractor. The advantages of doing the design first, before any construction is done, is that the owner can fully input into the design at a time when the design process is not on the critical path for completion of construction. The cost of any delays as a consequence of design changes are therefore kept to a minimum. The opportunity for the owner to have input in to issues such as reliability, whole of life costs and the method of construction are maximised.

However these significant advantages come at a cost. First, the owner will need to have sufficient resources to pay for the expensive design services. It would be difficult to secure project finance for such works as a financier will usually want to be satisfied that someone (usually the construction contractor) will undertake to complete the whole project for a sum certain, within a specified time and to a required standard. The design consultant will not provide these assurances. Neither will a contractor until the design is complete and it has had an opportunity to price the risks to be assumed. Accordingly unless the owner has sufficient funds, without recourse to project finance, the traditional form of contract is likely to be unsuitable. Secondly, the total time for project delivery is likely to be longer because, unlike the other methods of project delivery discussed in this article, design and construction are done sequentially, rather than concurrently. Thirdly, responsibility for project delivery is split with the consequence that where the project fails for a technical reason it can be difficult to identify the party responsible. For this reason project financiers prefer design and construct forms of contract where a single entity provides guarantees in respect of the total design and construction risk. Accordingly the traditional form of contract is less attractive from a project financier's point of view.

How Risk Is Allocated under a Traditional Form of Contract

Risks and their allocation are considered under the following headings:

(a) process engineering;

(b) civil, structural, mechanical and electrical engineering;

(c) quality of construction;

(d) cost of construction;

(e) time for mechanical completion and liquidated damages;

(f) commissioning and ramp up; and

(g) insurance.

Process Engineering Design

The process engineering design is the design of the chemical process which will be used to extract the resources sought to be won by the project. Such design is often resource specific; that is while there will be generic aspects of the chemistry necessary to extract the relevant resource, there may be present in any given ore body unique features which require an adjustment to the generic process design.

The construction contractor will not be responsible for the process engineering design. In most cases neither will the principal designer; its role being limited to the civil, electrical, mechanical and other engineering necessary for the project. Accordingly in many projects there will be two designers; the process engineer and the engineer responsible for the balance of the design. In the case of the process engineer the relevant design may be of a proprietor nature; that is the process engineer owns a monopoly right to exploit the relevant technology (perhaps by way of a patent). Great care is required to ensure that the owner procures sufficient rights by licence to use and modify the process design over the life of the plant. Also suitable warranties should be obtained (backed by appropriate insurance) guaranteeing the process. The relevant issues in relation to securing appropriate guarantees and insurance are discussed in further detail in Section 2 in respect of EPC contracts.

Civil, Structural, Mechanical and Electrical Engineering

Unlike the process engineering it is unlikely that the civil, structural, mechanical or electrical engineering will involve any proprietor information of the designer. Rather, the designer will prepare a specific design for the project applying standard engineering principles. The product of the efforts of the designer will obviously be subject to copyright and the owner needs, once again, to take particular care to ensure that its secures appropriate right to use the design, not just for construction but throughout the life of the project, including the right to modify the design if necessary.

Engineers will try to limit their liability for poor design. If the project is intended to be funded by project finance this should be resisted as far as possible. Effective insurance should be put in place to make the assumption of liability more palatable from the engineer's point of view. However even where suitable insurance is available it needs to be remembered that the insurance will be (usually) written on a claims made basis which requires that care be taken in drafting the consultant's contract, discussed in further detail below in Section 2.

Quality of Construction

The construction contractor takes responsibility for the quality of construction. The usual terms of contract require the contractor not only to rectify defects which are found in the construction period but also defects found during the defects liability period, usually 12 months after the date of completion. However these provisions only relate to defects in the construction. Therefore to the extent that the defect is a consequence of defective design, the contractor will not usually be required to rectify the defect at its cost. Often it is difficult to determine whether the defect is a due to poor design or construction. In those circumstances rectification can be delayed and in the worst case can lead to litigation.

As a consequence of the split in liability associated with design and construction it is very unusual for a contractor to give a warranty as to the finished works achieving the intended capacity (i.e. that the works will achieve the name place capacity).

Cost of Construction

The usual risk allocation in respect of the cost of construction, stipulated by the traditional form of contract, requires the contractor to guarantee the final cost to the owner, subject to specified exceptions. The nature and number of those exceptions will determine the extent of cost certainty from the owner's point of view and is dependent on the wording of the contract. The narrower the opportunity for adjustment to the lump sum price the more attractive will be the construction contract from a project financier's point of view.

Time for Mechanical Completion

In the traditional form of contracting, the contractor will usually take responsibility for completing the works within a specified time, subject to certain exceptions in respect of which the contractor will be entitled to an extension of time. If the contractor fails to achieve the required standard of completion by the specified time, then the contractor is usually liable to pay liquidated damages at a specified sum. Again the narrower the circumstances are which give rise to a right to an extension of time the greater will be the incentive on the contractor to complete on time.

Commercially it is likely that a contractor will insist on a cap on liability for liquidated damages (both in respect of the amount payable for each day of delay and for its overall exposure for delay). Subject to what is said below in relation to insurance, the owner takes the risk of delay after the cap is achieved. If the delay is such that the cap has or will be reached, the contractor's exposure to costs in respect to further delay is significantly reduced. The motivation of the contractor to achieve completion expeditiously is likewise reduced. The contract should consider ways in which the contractor's motivation can be maintained in these circumstances.

Commissioning and Ramp Up

After a project has achieved mechanical completion it is necessary to commission it to ensure that the component parts work as intended together and produce product of the required quality. Once this is achieved the plant will be gradually run faster and faster until the rate of production equals that specified by the design. This process is known as "ramping up". During both stages defects are identified and rectified. Further the works are tuned to ensure that the designed production rate is achieved. As will be appreciated a successful commissioning and ramp up is dependent upon design construction and operation. Accordingly, where the traditional form is used neither the designer nor the construction contractor is likely to warrant that the works will achieve the desired level of production in a specified ramp up period or at all.

This is another key difference to other forms of contract, where the contractor is responsible for both design and construction. In these other forms of contract, contractors are more often prepared to assume responsibility for both commissioning and ramp up. For obvious reasons the absence of warranties in relation to commissioning and ramp up is less attractive for project financiers, who will usually look for comfort that a creditworthy entity, other that the project vehicle/owner has taken responsibility for delivering an asset which is income producing within a specified time.

Insurance

Insurance is an important aspect of risk allocation in major projects. However not all risks are insurable. Others are usually only the subject of insurance indirectly. For example, the standard arrangement in relation to professional indemnity insurance does not provide a direct indemnity in favour of the owner. Rather, such insurance provides an indemnity in favour of the relevant professional in circumstances where the professional has been found liable for breaching the required standard of care. Often the owner will be forced to sue the professional to get access to the indemnity provided pursuant to the policy. The difficulties associated with this type of insurance are discussed in further detail below in Section 2.

3. SECTION 3: ENGINEER, PROCURE AND CONSTRUCT

The Engineer Procure and Construct (EPC) form of contract is popular with smaller mining companies, particularly those seeking to finance on a limited recourse basis. The principal advantages of this form of contract are that the contractor will take the major risks relating to the cost of construction, the time for completion and the quality of the finished product (including, in certain circumstances, in relation to commissioning and ramp up).

The extent to which the contractor assumes these risks will depend on the market at the time, the nature of the project and the number of competitors available to tender for the work.

It is unusual for EPC contractors in the process engineering area to assume full responsibility for cost, quality and time. Caps or limitations on liability are usually negotiated. Notwithstanding this, there are a number of examples in the last 10 years of contracts in which the EPC contractor has assumed significant risk, thereby providing high levels of comfort for equity and any project financiers.

As discussed above such an extensive risk allocation comes with a loss of control and therefore may be unsuitable for many owners who do not intend to finance their projects using project finance. For these owners EPCM, ECI or Alliancing forms of contract (discussed below) are more likely to be appropriate.

How Risk Is Allocated under an EPC Contract

Process Engineering Design

It is common for the process engineering to be provided by someone other than the EPC contractor. Therefore, it is necessary for the owner to enter into some licence arrangement with the process provider. As discussed above it is important that appropriate rights are secured to use and modify the process over the life of the project.

In relation to mineral processing, no two ore bodies are likely to be the same. Therefore, a process which works in one part of the world will not necessarily work (unamended) with an ore body in another part of the world. It is usual for the owner of the process engineering technology to be engaged to do laboratory and other testing to modify successful processes used elsewhere to accommodate unique aspects of a particular ore body. Those concerned with the risk of the process being inappropriate for the ore body may build a pilot plant to prove the process. Obviously this can be expensive.

The bargaining position of process engineering providers is usually strong. They own the intellectual property which the owner wishes to access. Usually the owner has taken care to ensure that the process

it has selected is the best available in the market. The process engineering provider that controls that technology can often insist on its terms.

This produces significant risks, especially where the process provider insists on extensive limitations on liability.

For example, in a recent project, the contract limited the process provider's liability to:

(a) re-performance of its work scope; and

(b) a further cap which limited the value of such re-performance to $3 million.

Accordingly, there was no allowance for the largest heads of loss likely to be suffered; the cost of rebuilding the plant to a new rectified design and any loss of revenue while such rectification works are performed.

The owner recognised that there was significant risk that the process might not work and that further engineering and construction might be required. The owner attempted to bolster the warranty given by the process provider by taking out, on the process provider's behalf, $50 million of professional indemnity insurance. That insurance was a conventional "claims made" policy.

Such insurance only responds when:

(a) a claim is made; and

(b) the insured is liable.

Given the limit of liability in the contract was $3 million, the insurance policy could only respond in respect of a claim up to $3 million (i.e. the maximum liability under the professional indemnity policy), notwithstanding having specified an indemnity limit of $50 million. However, in this case, the excess or deductable was $3 million. Accordingly, while the premium had been paid no insurance was actually available because of the way in which the insurance policy and the contract with the process engineer related to each other.

The owner's sole rights associated with a process failure were limited to having the process provider re-do the design and test work which was the subject of the licence and ancillary service agreements.

A failure of the process engineering may be capable of being fixed relatively easily by introducing more equipment, for example, to deal with impurities that are adversely affecting the product. However, more fundamental problems with the process can result in total project failure as a consequence of the plant being unable to process the particular ore to produce the required product.

Accordingly, care needs to be taken to ensure that the risk is adequately sheeted home to an appropriate party. This will usually require careful drafting of the agreements with the process engineer, together with appropriate support from insurers.

Cost

It is reasonably common that EPC contracts are let on a lump sum basis. This means that the remuneration of the contractor is capped subject to any specific exceptions. Such exceptions usually include changes in scope directed by the owner, changes in law and costs incurred as a consequence of acts or omissions of the owner.

Design (other than Process Design)

Under an EPC contract, the contractor is responsible for both the engineering (ie, design other than process design) and the construction. Accordingly, the risk of the proper performance of the design work lies with the EPC contractor.

Two issues often give rise to difficulty in this area:

(a) early works contractors; and

(b) insurance for the EPC contractor.

Early Works Contractors

It is common in the initial phases of the project for the owner to engage engineers on an EPCM basis (discussed below in Section 3) for the purpose of drawing design parameters which define the work scope for the EPC contract. These design parameters become a contract document in the subsequent EPC contract. At some point, the ordering of long lead time items becomes critical to the overall program for the project. If this point is reached before the EPC contract is let, the owner will enter into the necessary contract with the suppliers of the long lead time items, as principal.

If these contracts remained with the owner, then the project risk allocation would be split between the EPC contractor and the early works contractors. From a legal and administrative point of view, this is undesirable and would be unattractive to project financiers. Therefore, it is common to provide mechanisms whereby these early works contracts are novated to the EPC contractor so that it can take responsibility for the early works contractors. This requires appropriate provisions in both the early works contracts and the EPC contract.

However, difficulties arise where the early works contracts are less favourable to the owner than the contract ultimately negotiated with the EPC contractor. In these circumstances, the EPC contractor (properly advised) will be unwilling to accept responsibility for the early works contractors where it cannot pass that liability back to those contractors because of unfavourable terms originally negotiated by the owner under the early works contract arrangement. It is therefore important to ensure that all contracts, including early works contracts, are consistent or that the risk allocation in the early works contracts is superior to that contained or to be contained in the EPC contract.

Insurance

As with the process provider, it is common for the EPC contractor to take out professional indemnity insurance to cover itself in the event of a claim by the owner that the design is defective. Often, the EPC contractor will seek to limit its liability to the extent of the insurance available to it.

The example in respect of professional indemnity insurance relating to the process design is applicable here; that is, the policy only responds if the insured (the contractor) is liable. Obviously, if the EPC contract limits the liability of the EPC contractor to an amount which is is less than the indemnity limit specified in the insurance policy, the indemnity available under the policy will be less the indemnity limit because of the further limitation specified in the EPC contract.

A further issue often arises because contractors try to negotiate provisions which state that they will only be liable if:

(a) the insurance responds; and

(b) then only to the extent of such response.

Implicit in such a clause is that the owner takes the risk of the solvency of the insurer. However, more importantly, much of the drafting which tries to achieve this outcome produces a catch-22 situation:

(a) the claims made insurance policy only responds where the EPC contractor is liable; and

(b) the EPC contractor is not liable unless the insurance responds.

Such arrangements produce a mismatch between the EPC contract and the insurance contract which grants the insurer a respectable argument that it can <u>never</u> be liable. This is because its liability depends on the contractor being liable, but the contractor is not liable until the insurer is liable. Accordingly, great care needs to be taken to ensure that the contractor is sufficiently liable to satisfy the requirement for the insurers liability to be invoked under the insurance policy.

The amount of cover available to a contractor (obviously) also depends on the wording of the relevant insurance policy. Not all professional indemnity policies are the same. A common exclusion under professional indemnity policies stipulates that the policy will not respond in respect of a liability assumed

by a professional in excess of that which would have been imposed by the common law. Professionals (such as designers) are usually only liable at common law for a failure to exercise reasonable care.[1] However, many EPC contracts require a contractor to guarantee that the design is "fit for its intended purpose". Such wording places significantly more liability on the contractor than that imposed by the common law. Accordingly, if a claim is made pursuant to such a provision and the insurer has a standard exclusion in respect of liability in excess of that assumed at common law, the insurer may argue that the policy does not respond.

Construction

Under a typical EPC contract, the contractor will assume responsibility for completing the works:

(a) to the standard specified (if any);

(b) using materials that are of merchantable quality and are otherwise fit for their intended purpose; and

(c) in a proper and workmanlike manner.

In the process engineering area, EPC contractors will (by reference to general caps) seek to limit their liability in relation to this aspect of the work as well. Generally, insurance is not available for defective workmanship or materials.

Notwithstanding that there is no insurance available for defective materials and workmanship, the contractor does have a method of sharing the risk associated with defective materials and workmanship. Pursuant to most EPC contracts, the EPC contractor will enter into a myriad of supply agreements and subcontracts.

At the supplier subcontractor level of the contractual chain, there are many more competitors able to do components of the work. For example, the EPC contractor will usually enter into a subcontract with a civil engineering contractor to provide civil and structural engineering services. Limits of liability (particularly regarding materials and workmanship) in this market are rare. Accordingly, such contractors are often willing to provide uncapped warranties in relation to construction.

However, as the subcontracts become more exotic and the number of available suppliers for the equipment in question reduces, there is usually a corresponding increase in the difficulty of securing complete warranties under those contracts.

Accordingly, from a commercial point of view, it seems that an owner should try to:

(a) secure a warranty from the EPC contractor that its liability in relation to the quality of construction is limited only to the extent that it is unable to pass that liability on to third party contractors; and

(b) secure, at least in respect of the significant subcontractors, collateral direct contracts with these subcontractors to take advantage of the benefit of the warranties provided.

Time for Mechanical Completion and Liquidated Damages

The EPC contractor typically accepts responsibility to complete the works by a particular time, subject to an extension of time provision.

Obviously, the extent of the risk the contractor assumes depends, in part, on the extension of time provision. It is usual to provide extensions of time for limited force majeure events (ie, events beyond the control of either the owner or the contractor) and for acts of prevention by the owner or those for whom the owner is responsible.

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[1] *Voli v Inglewood Shire Council* (1963) 110 CLR 74; *Brickhill v Cooke* [1984] 3 NSWLR 396; *Pullen v Gutteridge Haskins & Davey Pty Ltd* [1993] 1 VR 27.

In relation to the second class of delay, delay arising as a consequence of acts or omissions of the owner, the owner must provide a proper mechanism for granting the contractor extensions of time. Failure to do so is likely to render the time provisions in the contract unenforceable as a consequence of the prevention principle.[2] Pursuant to this principle, if circumstances arise whereby:

(a) the owner or those for whom the owner is responsible (principally its agents and servants) cause a delay to the contractor; and

(b) either:

(i) there is no mechanism in the contract for granting an extension of time for such delay; or

(ii) there is such a mechanism but it does not work in the circumstances,

then, at common law, the time provisions and associated liquidated damages clauses will be unenforceable.

It is also common in such contracts to provide that the contractor must pay the owner liquidated damages if the project is delayed. Such liquidated damages must be a genuine pre-estimate of the loss.[3]

A common mistake is to estimate the total revenue likely to be lost as a consequence of a delay in mechanical completion and then using the number so calculated in the liquidated damages clause. Such a calculation is unlikely to be correct. If the process plant is for the purposes of processing a mineral reserve, a delay in mechanical completion merely causes a delay in the revenue. The revenue is <u>not</u> lost. It is therefore inappropriate to calculate the liquidated damages by reference to the anticipated lost income during the period of delay.

Assume that the mine has reserves of 30 years and that the project is delayed by a year. No income is earned in the first year in which income was intended to be earned. That income has been effectively postponed to year 31. Therefore, the appropriate calculation of the anticipated loss is:

(total lost revenue during period of delay) minus
(the net present value of that income, when earned, probably in year 31)

Where contracts exclude liability for consequential loss, except to the extent of liquidated damages, it is prudent to provide that if the liquidated damages clause fails for any reason, then the owner will be entitled to general damages for consequential loss to the limit stipulated by the liquidated damages clause. Otherwise, the owner can find itself in the invidious position of not being able to enforce the liquidated damages provision and not being able to recover general damages as a consequence of an independent consequential loss limitation.

It is extremely common in EPC forms of contract for there to be a significant limit on the amount of liquidated damages available, perhaps 10% of the contract sum or less. This is particularly important for the providers of debt who are anticipating that they will be paid interest and capital from the income flow of the project. A delay to that income flow will be a significant issue for a project financier. As discussed above, subject to the comments about insurance below, once the cap is reached the owner is on full risk for the opportunity costs that will be suffered as a consequence of any delay. Also the cost of delay to the contractor will reduce significantly when the cap has been reached thereby reducing the commercial imperative for the contractor to accelerate completion.

<u>Extended Liquidated Damages Insurance</u>

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[2] *Peak Construction Limited v McKinney Foundations Pty Ltd* (1970) 1 BLR 111; *SMK Cabinets v Hili Modern Electrics Pty Ltd* [1984] VR 391; *Turner Corp Ltd (in liq) v Co-Ordinated Industries Pty Ltd* (1995) 11 BCL 202; *MacMahon Constructions Pty Ltd v Crestwood Estates* [1971] WAR 162; *Turner Corporation Pty Ltd (Receiver and Manager Appointed) v Austotel Pty Ltd* (1994) 13 BCL 378.

[3] *Dunlop Pneumatic Tyre Co Ltd v New Garage & Motor Co Ltd* [1915] AC 79; *Ringrow Pty Ltd v BP Australia Pty Ltd* (2005) 224 CLR 656.

In the 1990s, some projects had the benefit of insurance designed to pick up the risk after the contractor's liability had been exhausted. Such insurance had been available pursuant to a line slip through Adam Brothers of New York. These policies are unusual and bespoke.

A large claim was made by (and paid to) Anaconda Operations Pty Ltd (the joint venture vehicle for the Murrin Murrin Nickel Mine) against such a policy in 2000. The settlement sum (after international arbitration in London) was A$113 million. In light of that claim, the events of 11 September 2001 and the global financial crisis, extended liquidated damages insurance is likely to be offered only to projects with very conventional engineering and at significant premiums.

Commissioning and Ramp Up

Each process plant is unique. Accordingly, as discussed above, it is always anticipated that it will take some time from mechanical completion to commission the plant and ramp it up to full capacity.

At this stage of the project, the owner invariably wants to be in control of the plant. However, particularly with inexperienced owners, there is significant risk that the owner will not have the technical or other expertise to effectively ramp up the plant to full production or to teach its workers how to operate the plant.

For these reasons, where there are inexperienced owners or the project is financed on a limited recourse basis, the owners will sometimes enter into an agreement whereby the EPC contractor, or perhaps the process provider, provides commissioning and ramp up assistance.

Such contracts often stipulate a ramp up curve and provide for liquidated damages for failure to achieve production levels anticipated at the time of contract. Usually, the liquidated damages stipulated are a cap on the contractor's liability.

Again, the prevention principle (discussed above) is very important. If the production levels set are not achieved as a consequence of an act or omission of the owner, then, pursuant to the prevention principle, it is highly arguable that the liquidated damages payable under the ramp up agreement will be unenforceable. When coupled with an exclusion of all consequential loss, the owner will arguably be left with no remedy.

This outcome is a distinct possibility where the owner has taken over responsibility for the operation of the plant (as is the usual case). Accordingly, it is recommended that there be a mechanism, similar to an extension of time provision under a conventional construction contract, whereby the thresholds stipulated in the contract can either be adjusted, or the period in which performance is to be achieved can be changed, to take account of acts or omissions of the owner.

Again, it is important to ensure that the liquidated damages are a genuine pre-estimate of the loss so that the clause does not impose a penalty.

Works Insurance

Works insurance or construction all risk (CAR) insurance is a fundamental component of risk mitigation in process engineering projects, for both the owner and the EPC contractor. However, this type of insurance has significant limitations. There are also marked differences between policies as to the risks that are covered, depending, for example, on whether a project is located on or offshore.

The primary purpose of CAR insurance is to insure the physical works or facilities being constructed against loss or damage arising from an "occurrence". In other words, it is an event-based insurance triggered if an "occurrence" causes physical loss or damage to the works. "Occurrence" will be defined by the policy wording but in general it will include events such as fire and natural disaster as well as the negligence or mistake of the parties. Both the owner and the EPC contractor are named as insured and it is common for either the owner or the EPC contractor to take out the insurance.

Where a party to the construction contract give indemnities to the other party which are also given by an insurer, care should be taken to:

(a) avoid creating coordinate liabilities between the indemnifying party and the insurer which would give the insurer the right to seek contribution from the indemnifying party; and

(b) ensure that the policy of insurance taken out in the joint names of the parties has a waiver of subrogation clause to avoid the insurer subrogating to the non-indemnifying party's right and seeking to recover from the indemnifying party.[4]

Finally, exclusions of liability can become problematic. The extent and nature of the exclusions will significantly affect the risk allocation agreed between contractor and owner.

The advantages and disadvantages of EPC contracting are considered below by way of a comparison with the EPCM form of contracting.

4. SECTION 4: ENGINEERING PROCUREMENT CONSTRUCTION MANAGEMENT

Under the EPCM form of contract, the contractor is responsible for:

(a) designing the works to be constructed;

(b) procuring, on behalf of the owner (as agent), of necessary materials and equipment; and

(c) managing, on behalf of the owner (as agent), the construction.

The important difference between the EPCM and EPC forms of contract is that under the EPCM form, the contractor is not a principal in relation to the procurement of plant and materials, or construction.

Rather, the EPCM contractor acts as the owner's agent and creates contractual relationships with suppliers and trade contractors. Each trade contract is a contract directly between the owner and the trade contractor. The EPCM contract gives the owner significant control over the project and is therefore suitable for those projects where the owner has significant expertise and is comfortable taking a lead role in the delivery of the project. However with higher level of control comes a loss of the capacity to shift risk to contractor. Therefore the owner assumes much more risk in relation to the cost of the project, the time taken to complete and the quality of the project. As a result it is much more difficult to finance a project being delivered this way using project finance. It can be expected in the current market that, at least, projects delivered this way will require a lower debt to equity ratio than would be the case (for example) if the project was being delivered using an EPC contract, where the EPC contractor had a significant balance sheet.

The EPCM contractor's main liabilities relate to:

(a) negligence in the performance of the design work; and

(b) negligence in managing the procurement and construction work.

How Risk Is Allocated under an EPCM Contract

Under conventional EPCM contracts, price, time, process and other design are generally dealt with as discussed below.

Cost

The EPCM contractor will be responsible for developing budgets and managing costs in accordance with those budgets. The EPCM contractor will not be liable to the owner simply because the cost of

[4] See *Caledonia North Sea Ltd v London Bridge Engineering* [2000] Lloyds Rep IR 249; *Maintenance Australia Pty Ltd v Hamersley Iron Pty Ltd* (2000) 23 WAR 291 and the very useful discussion by Mark Williams in "House of Lords Final Chapter in Elf Saga" (2002) 17 *ILB* 33.

construction exceeds the budget. However, it is obliged to exercise reasonable care. This is a relatively low duty and cost blowouts will not generally be the EPCM contractor's responsibility.

However, as design proceeds, packages of work will be developed and let to trade contractors (usually) on a lump sum basis with a conventional risk allocation only allowing for cost increases due to specified events.

Once all of those contracts are let, the owner will have to recast its budget to reflect the aggregate of those contracts, plus an allowance for contingencies. At this point, the price is reasonably certain, but the risk profile is still less attractive than under a conventional EPC contract. This is because the owner will generally take the co-ordination risk as between the trade contractors. Therefore, if:

(a) trade contractor A delays trade contractor B (because, for example, trade contractor A must complete its work before trade contractor B can start its); or

(b) trade contractor A damages trade contractor B's work; or

(c) trade contractor A causes the owner to be in breach of trade contractor B's contract for some other reason,

then depending upon the drafting of the trade contract, the owner may be liable to trade contractor B and may (again depending upon the wording of the trade contracts) have a cause of action against trade contractor A.

In a clear cut case where the facts are well understood and there is no dispute as to the relevant engineering, the owner should be able to transfer this risk to trade contractor A (preferably by way of setoff or by accessing security provided under the trade contract). However, in less clear circumstances, each trade contractor may allege that the other is responsible for the relevant loss or damage. If these allegations cannot be resolved commercially, litigation becomes a real possibility which, apart from the unwanted distraction, can be very expensive.

Time

Again, the EPCM contractor is responsible for co-ordinating the trade contractors in an attempt to ensure that the program is met. The EPCM contractor will not be liable for breaches of contract by the trade contractor, unless they were a consequence of some negligence by the EPCM contractor.

Each trade contractor takes responsibility for completing its package of work by the date stipulated in the program.

However, it will be difficult for the owner to transfer the risk of co-ordination between the trade contractors or the risk of delay which one trade contractor causes another. Where these risks arise it is likely that the owner will be subjected to claims by trade contractors affected. The owner may be able to seek an indemnity from the trade contractor (if solvent); however litigation involving 3 or more parties is slow and expensive. Accordingly there is a risk that the enforcement of the contract is too expensive with the result that the risk rests with the owner, notwithstanding the theoretical capacity to pass it on to the responsible trade contractor.

A further disadvantage of the EPCM method of project delivery is that the amount of liquidated damages available is likely to be less. Each trade contractor is likely to seek a limit of liability based on its contract price. As each contract price under the trade contract will be significantly less than that which would have prevailed under an EPC arrangement, the total liquidated damages available are likely to be significantly less, because delay is likely to be caused by a small number of the trade contractors.

Design

Design liability pursuant to an EPCM contract is similar to that under an EPC contract (discussed above). However, under an EPCM arrangement, an owner with appropriate in-house resources can supervise the design so as to catch any defects at an early stage. As the EPCM contractor is usually paid on a cost plus basis such comments are likely to increase the costs. Under an EPC contract if the design is not prepared by the contractor to the required standard, the owner may direct the contractor to rectify the design at

its cost. However, if the owner wrongly characterises an aspect of the design as defective, the contractor is likely to be able to make further claims on account of the extra work done to satisfy the owner. The tendency under EPC contracts is that owners refrain from commenting on the design to avoid claims for variations or delay arising from a misplaced criticism of the contractor's design.

Construction

Through the trade contracts, the owner should be able to allocate the risk associated with the proper construction of the works (ie, use of material of merchantable quality, fitness for intended purpose and proper workmanship) to the various trade contractors. Further, at this level of the market, many trade contractors will accept significant risk in relation to the quality of their own work (as opposed to the design).

Advantages/Disadvantages of EPCM and EPC Contracts

The obvious advantage of an EPC contract is that the owner defines the work, usually by reference to a performance specification. The contractor takes responsibility on a single point basis (except perhaps in relation to process engineering) in respect of:

(a) the cost of completion (subject to limited adjustments);

(b) the time for completion (subject to extensions of time); and

(c) the quality of the design and work (subject to any exclusions).

However, the major disadvantage of the EPC contract is that the detailed design and method of construction is the contractor's prerogative. Accordingly, great care needs to be taken in defining the design parameters so that the project meets the owner's standards. This usually requires more than simply stipulating performance criteria in relation to the output of the plant.

Particularly in a lump sum environment, the commerce of the transaction will mean that the contractor wants to deliver the project at the lowest possible cost. One of the ways the contractor can lower costs where it has design discretion is by choosing the cheapest possible design consistent with the design criteria.

The design criteria must therefore deal with everything that is important to the owner, including:

(a) performance;

(b) whole of life costs;

(c) operability (including maintenance); and

(d) mechanical availability (in so far as this is not covered by a performance criterion regarding output).

Even where these things are stipulated, an EPC contract usually requires the contractor to provide the owner copies of the designs. The EPC contract, if properly drawn, will contain:

(a) a provision entitling the owner to reject the design if it does not comply with the design criteria; and

(b) a variations clause.

Many disputes arise under this form of contract where the owner has rejected designs on the basis that they do not comply with the design specification (as the owner understands it). Often, the contractor will argue that its design did comply and that the owner's rejection of its design is based upon engineering preference (often driven by important issues such as whole of life costs, operability and maintenance).

The contractor will further argue that the directions rejecting the design (which the contractor contends complies with the specification) are instructions to vary. This will leave the owner exposed to unintended claims for variations.

This is why experienced EPC project managers avoid commenting on the EPC contractor's design during the course of construction. The owners and financiers ultimately rely on the contractor's warranties that it will produce a plant which meets the design criteria. Where the contractor fails to meet the design criteria, this reliance can cause significant delay either in mechanical completion or the commissioning and ramp up phases.

This is especially problematic where there are significant limitations on liability. For example, if there is an overall limit of liability of 20% of the contract sum and there is a significant failure of design and construction which requires rectification costs of 50% of the original contract sum, then the owner may be left with 60% of the risk associated with the contractor's failure to achieve the contractual objectives. In addition, the consequential losses will be limited by any cap on liquidated damages. While these figures may seem extraordinary, and are probably unlikely to occur regularly, there have been disputes in which the owner has contended that the defects in a plant exceed 50% of the value of the original contract price. Accordingly, if the cost of an EPC contract includes significant limitations on liability, the owner should consider whether EPCM is a more appropriate method of project delivery. This may be the case because, given that the risk which is shifted by the contract is constrained by the limitations of liability, the owner would be better off taking a more proactive position, which is easier to do with an EPCM contract.

Because the EPCM contractor is the agent of the owner and does not take responsibility for the final cost of construction or the time for completion (except to the extent of its management role), the owner can interfere extensively during the course of design and construction to ensure that it achieves what it requires. This may be appropriate where the owner can devote significant technical resources to the design process.

5. SECTION 5: EARLY CONTRACTOR INVOLVEMENT / MANAGING CONTRACTOR

Obviously, when a project starts there is little, if any, design available. Even if the contractor is to be charged with the responsibility of preparing the detailed design, before such a contract can be finalised and executed, the contract must contain sufficient description of the detailed design and construction work required, so that the EPC contractor can price the works on a lump sum basis. Often the work scope used for the EPC contract is prepared by the owner or consultants employed by the owner. However in many cases efficiencies can be gained by getting the contractor's input well before the design parameters are settled. As the name suggests the Early Contractor Involvement (ECI) model is designed for these circumstances. The owner might benefit from the contractor's early involvement because, for example, it is expected that the design will be complex. Such complexity may mean that, without the contractor's early involvement, consultants charged with developing the design would produce a design which is difficult to build (the Sydney Opera House is perhaps one prominent instance). The ECI form of contract may also produce efficiencies when the project must be delivered in a very short time. The early involvement of the contractor may allow for the acceleration of certain activities by allowing those activities to be done concurrently rather than sequentially (for example design and cost estimation).

The ECI approach has recently become popular, but it is not new. Since the early 1990s, the Department of Defence has been using a managing contractor model designed by Clayton Utz that is an ECI model in all but name.[5] In the United Kingdom, the Highways Authority has delivered projects on an ECI basis since the late 1990s. The ECI model comes in many forms.

[5] See Nicholas Tsirogiannis and Marko Misko, "Relationship Contracting: The Managing Contractor Model", 16 September 2009, available at http://www.claytonutz.com/publications/newsletters/projects_insights/20090916/relationship_contracting_the_managing_contractor_model.page.

Despite this variety, in recent times, the preferred approach to ECI contracting has become more settled. There are three discrete steps.[6]

(a) The preliminary step is an abbreviated tender process in which the owner selects the contractor for Stage 1.

(b) In Stage 1, the contractor works with the owner to develop the design and other plans for the project. The contractor is paid during this stage on a cost plus basis and apart from providing input into the design prepares a "Risk-Adjusted Price", known as a "RAP". This price is the contractor's price to complete Stage 2.

(c) If the owner considers the Risk-Adjusted Price acceptable, the owner will engage the contractor to perform the Stage 2 work, the final delivery of the project. If not, the owner might ask alternative contractors to price the project. In Stage 2, there may be more traditional fixed-price contractual arrangements, or alternatively, the owner may choose to continue with a relationship-based approach.

How Risk Is Allocated under an ECI Contract

As discussed above, the risk allocation can vary greatly from one ECI project to the next. It is useful, thus, to compare two common approaches to Stage 2:

(a) the "managing contractor" approach to ECI (which emphasises the ongoing relationship between the parties); and

(b) the "traditional" approach to ECI (which emphasises contractual liability).

Managing Contractor Approach to ECI

Under this approach, the contractor must use its best endeavours to complete the project by the date for completion, but will not be liable for liquidated damages. To satisfy the best endeavours obligation, the contractor would typically need to do things like create detailed programs and properly administer subcontracts.

Similarly, there is no fixed cost, and the contractor must instead use its best endeavours not to exceed a target cost.

In relation to quality, though, the contractor warrants that the project will be fit for its purpose and therefore takes full risk in this regard.

Traditional Approach to ECI

Under the traditional approach to ECI, there is a fixed date for completion, and subject to extensions of time, the contractor is liable for liquidated damages for late completion.

There is typically also a fixed price for completion. On some projects, however, other arrangements have been applied, notably sharing of over or under-budget results.

As with the managing contractor approach to ECI, the contractor typically warrants that the project will meet a specified standard.

Advantages/Disadvantages of ECI Contracts

The advantages of ECI arise, unsurprisingly, because of the early involvement of the contractor. These are some of the major advantages:

[6] For further detail, see Julie Whitehead, "Early Contractor Involvement — The Australian Experience" (2009) 4 *Construction Law International* 20.

(a) The project may be delivered faster, partly because of the reduced time for tendering, and partly because the closer relationship between the owner and the contractor may allow more tasks to be undertaken simultaneously.

(b) The early involvement of the contractor, as the party who will or at least could perform construction, may lead to a better interface between design and construction, which should in turn reduce costs and engineering difficulties.

(c) There may be fewer variations because the contractor has been more closely involved in the development of the project.

(d) As with the EPCM form of contract the owner has significant control, particularly in the early stages before the price firms up, to be actively involved in the decision balancing whole of life costs with issues relating to maintenance and reliability.

The major disadvantages, which are in general financial, include the following:

(e) The minimal tendering reduces the contractor's tendering costs, but may effectively transfer these to the owner.

(f) It may be more difficult for the owner to obtain project finance because the costs of the project will not be determined until well after the contractor has been engaged. Further, project financiers may be risk averse because relatively few prominent projects have been let on ECI basis.

(g) Probably the main risk from an owner's perspective is that, compared with a usual tender, there is little competitive tension when the contractor is determining the risk-adjusted price.

(h) Finally, where the managing contractor approach to ECI is applied, the owner has reduced certainty about time and cost.

6. SECTION 6: ALLIANCE CONTRACTING

Alliancing defies precise definition because it is a term used to describe a variety of project structures that emphasise the parties' approach to their relationship rather than strict legal rights enforceable between those parties. Another legal commentator has defined the concept this way:

> "Essentially alliancing is a collaborative, incentive driven method of contracting where all the participants work co-operatively to the same end, sharing the risk and rewards of bringing in the project within time and under cost, whilst respecting principles of good faith and trust".[7]

The agreement that establishes the alliance relationship will generally have these elements:

(a) an "Alliance Board" that controls the project and in respect of which the agreement stipulates:

  (i) its composition (representatives from each participant);

  (ii) the method of voting (equal voting rights); and

  (iii) typically, that decisions be unanimous (it is recommended that anonymity be required and that no mechanism be included to deal with a deadlock; the Board should be left to resolve the matter);

[7] Presentation by Tony Abrahams as reported by Juliet Pratley, in "Project Alliancing: Does It Work?" (1999) 15(2) *Building Australia* 33.

(b) an integrated development team, drawing on the best available resources from each participant, that is distinct from the organisations of each of the participants and is housed in separate offices, operates with its own logo and identity, etc, in order to create an appropriate environment for working together to achieve common goals; and

(c) clear commercial arrangements between the parties regarding:

(i) splitting the margins;

(ii) personal injuries, property damage and third party liabilities;

(iii) apportionment of liability;

(iv) liability limitation;

(v) default of a party; and

(vi) dispute resolution.

The concept is relatively simple, the aim being to create an "entity" which will manage the project. Usually this Alliance Board is not a legal structure. The representatives on the Alliance Board would in a typical example include representatives from the designer, the contractor and the owner.

Each representative is given one vote and, in the recommended model, there is no casting vote. Accordingly, the owner (who has to live with the project for the rest of the facility's life) cannot control the situation if there is a disagreement, but must compromise to ensure that there is agreement. Presumably, proponents of alliance contracting recommend that unanimity be required to remove control from the owner, however this will not suit many owners. Accordingly, there are a number of examples where this aspect of alliance contracting has not been adopted.

How Risk Is Allocated under an Alliance Contract

Design

The designer will generally not be liable for negligent design or a failure to deliver the design in a timely fashion. The cost consequences of defective or late design can be significant.

It may mean that the project does not meet its design criteria. In the case of a processing plant (for example), this may mean that it cannot produce the product either at all or at a rate which makes the plant commercially viable.

In a fast track contract where the design process is on the critical path of construction, late delivery of design can add significant extra costs. In major projects, overheads may exceed $1 million per day. Any delay in finalising the design or in rectifying it during the construction process will be very expensive in such projects.

The idea behind an alliance is not to make the parties liable for specific defaults but rather to provide an adjustment in the remuneration payable to the consultant and the contractor by reference to specified Key Performance Indicators (KPIs). The KPIs are directed to matters that are important, from the owner's point of view, to achieve a successful project. Obvious candidates KPIs include the completion of the project on time, to the required standard and within budget. However KPIs may not be limited to these issues and may include things such as site safety. An alliance does not focus on the performance of any party but rather provides an adjustment (positive or negative) when a KPI is achieved or not. A negative adjustment is made irrespective of whether the alliance party was responsible for the negative outcome. If the project goes well all participants share in the success and likewise if the project does not achieve the level of success set by the KPIs, all participants suffer a negative adjustment. The intention is that these types of adjustments (which are not fault based) will align all parties' interests with that of the success of the project. It will also prevent the parties from taking adversarial positions and will promote teamwork between all of those involved in the project.

However, the negative and positive adjustments of the contractor and consultant are capped. It is common that these parties' negative adjustments are limited to their margin, perhaps 10%. This means that if significant project risks occur it is likely that the owner will bear the majority of the cost over runs or other losses even if those losses were caused by an act or omission of one or more of the alliance partners.

A question therefore arises as to whether losses associated with, for example, negligent design can be recovered pursuant to any insurance. Most insurance available to designers is "liability insurance". This means that the insurer will not pay unless the designer is liable. If the alliance contract states (as is usual) that the designer is not liable except for wilful default, the standard professional indemnity policy is unlikely to respond at all, because:

(a) under the alliance contract, the designer is not responsible for its acts or omissions, other than wilful default; and

(b) most policies exclude liability for wilful default.

If the owner is to have any comfort, it would need some form of insurance which allows a claim merely because the design is not to the required standard. However, insurers are generally reluctant to assume risk where the person primarily charged with responsibility for the task does not carry any personal responsibility. Notwithstanding this, the insurance market has offered some cover on this basis, but it is limited and expensive (where available). Absent such insurance, the design risk rests firmly with the owner.

Construction

If the contractor performs defective work, it must be rectified. If, as is usual in this form of contract, the contractor is not liable for breach (except wilful breach) and is entitled to be paid for rectifying defective work, then the owner will bear the costs of rectification.

Cost

Each participant is paid on a cost basis. Whether they recover any profit or overhead usually depends on the success of the project. That is, the parties' interests are aligned by making the non-owner participants' profit margin (and perhaps more) at risk. This "pain/gain" share is designed to provide the commercial incentive to ensure that the non-owner participants perform their parts of the project properly. Further, in a well designed alliance, the key performance indicators which regulate the non-owners' participation in the pain/gain share payment adjustment will be directed to the owner's objectives. Hence, it is argued that alliance contracting makes the non-owner participants focus on the owner's commercial objectives rather than just their own commercial interests and thereby produces an environment where best project outcomes are achieved by a single highly motivated team. However, if, for example, the designer performs defective design work which requires the contractor to perform the work more than once, the costs associated with that re-performance will, subject to the pain/gain mechanism, rest with the owner.

Advantages/Disadvantages of Alliance Contracts

In October 2009, Evans & Peck and The University of Melbourne released a study of alliances that they had prepared at the request of the Department of Treasury and Finance, Victoria.[8] The research was based mainly on 14 detailed case studies of recent alliances from across Australia.

The key findings of the study support the view that alliances can promote strong non-financial outcomes. The following findings are particularly relevant.

(a) "In general, Owner representatives ... rated their alliance's performance in all areas of non-price objectives as above expectations or game breaking." (Key Finding 8.)

[8] "In Pursuit of Additional Value: A Benchmarking Study into Alliancing in the Australian Public Sector", first presented at the Alliancing Association of Australasia convention on 22 October 2009 (available at www.dtf.vic.gov.au/project-alliancing).

(b) "The majority of projects met the owners' target completion dates as set out in the business case." (Key Finding 10.)

(c) "There were no indications of any disputes between the Owner and the NOPs [non-owner participants] that needed to be resolved outside the alliance." (Key Finding 11.)

The first two good non-financial results are most likely to be achieved where all parties involved have good management skills and experience in similar projects, and are committed to the relationship. The third is a function of the nature of the legal structure. The relevant contracts are drawn to limit or prevent liability totally (except in the case of wilful default or fraud).

The principal advantage of the alliancing structure is that it is designed to encourage the participants to reach agreement and act as a team. However, the requirement of unanimity may grant one party a commercial weapon that allows it to achieve some ulterior commercial objective.

Naturally, the establishment of an integrated development team is a management issue rather than a legal one. Those that advocate alliance contracting argue that to make the designer or contractor liable for damages in the event of non-performance is destructive of the team. They suggest that:

> "'Blame' is contrary to the fundamental concept of alliancing, and hence the associated contracts restrict access to the courts to breaches of contract or duty which amount to "wilful default". Hence the parties do not sue each other over questions of negligence or even gross negligence".[9]

The desire to avoid liability is the usual incentive for completing the works in accordance with the contract. Under alliancing, the incentive is generally said to be achieved because the contractor puts at risk its profit and some or all of its (including, sometimes, off-site) overheads. Contractors' margins are usually relatively small when compared with the total value of the project (eg, profit of between 1% and 5%).

Further, whether the profit and overheads are really put at risk will depend on how the base cost is calculated. This is often done by reference to rates for plant, equipment and people. These rates are often structured to recover both profit and overhead. Accordingly, if the alliancing model is adopted, great care needs to be taken in defining costs.

Evans & Peck and The University of Melbourne acknowledge weaknesses with the business cases developed for the alliance projects they examined, but they nonetheless conclude in Key Finding 1 that, for the 14 representative projects they examined:

> "The average increase from business case cost estimate to Actual Outturn Cost (AOC) was of the order of 45-55%."

The evidence from recent alliances suggests that they can promote good non-financial outcomes. However, this comes at the risk of significant cost overruns.

PART 2 — FACTORS THAT MAY ERODE THE CONTRACTUAL RISK ALLOCATION

Part 1 of this paper considered five methods of contracting that parties may consider when seeking to cement their risk allocation —Traditional, EPC, EPCM, ECI and Alliancing.

Notwithstanding the written risk allocation agreed between the parties, various factors may mean that, without good advice, the practical risks that parties assume are not what their written agreement suggests. Part 2 of this paper considers three things that may affect the parties' risk allocation:

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[9] Graham Thomson, "Project Alliances" (paper presented at the 21st AMPLA Conference, 24 July 1997, at 8). Thomson cites these principles from an article by B Scott, "Partnering and Alliance Contracts: A Company Viewpoint", April 1994.

(a) proportionate liability;

(b) the need to enforce contractual rights against domestic parties; and

(c) the special risks that arise where there are international counterparties.

The focus in this brief discussion is on the strategies that parties may adopt to achieve greater certainty that their intended risk allocation will apply.

1. SECTION 1: PROPORTIONATE LIABILITY LEGISLATION

Where two or more parties enter into a contract, they will often agree that liability under that contract is to be "joint and several". Even where there is no expression provision in the contract some States have passed legislation which has the effect, absent a provision to the contrary, that liability is joint and several. Joint and several liability can also arise in tort where there are joint tortfeasors or two or more independent tortfeasors cause the same loss.

Joint and several liability means that either of the parties can be sued in the event of damage due to their wrongful conduct (where that conduct, for example, amounts to either a breach of contract or a breach of duty). Any party jointly and severally liable is liable for the whole of the loss (irrespective of the level of responsibility).

In contract law, this is especially useful where the same promises are made severally by two companies, where one company is of substance and the other is not. In those circumstances, the party receiving the benefit of the promise can take comfort in knowing that at least one of the promisors is capable of meeting a damages claim if the promise is not fulfilled.

This is particularly important in very large projects, such as large private infrastructure projects. The existence of joint and several liability allows financiers and equity providers to be satisfied that the joint promisors (when their balance sheets are considered together) have the capacity to deliver on the promises made or to pay damages if they fail to so deliver.

However, in the last decade, policy makers have become increasingly concerned about joint and several liability. In the early 1990s, there were a number of spectacular corporate collapses. Inevitably, these collapses were followed by protracted litigation directed largely at the accounting profession. This was a prominent example of the way that joint and several liability can encourage plaintiffs to sue defendants with the deepest pockets, regardless of their contribution to the plaintiff's loss.

In response to this, and to the crisis in the insurance industry after the collapse of HIH, the States and Territories progressively enacted legislation introducing "proportionate liability". This concept, very attractive to both professionals and their insurers, was that instead of having joint and several liability, each wrongdoer who was otherwise jointly and severally responsible for the loss would only be liable "having regard to the extent of the defendant's responsibility for the damage or loss". It followed that, depending on the legislation in the relevant jurisdiction, where other defendants were insolvent or could not otherwise meet their share of the liability, the plaintiff will fail in a practical sense to recover the loss suffered.

The primary difficulty that arises in respect of this legislation is that parties may desire joint and several liability and may agree to this in their written contract, but the proportionate liability legislation in a number of states is likely to override this agreement. (It is only clearly possible to exclude the operation of proportionate liability legislation in Western Australia, and perhaps New South Wales.)[10] It may also interfere with contractual risk allocation in separate contracts where no issue of joint and several liability arises. All of this makes the task of allocating risk by contract far more difficult than it once was. This difficulty is increased because there is no uniform legislation.

[10] For more detailed criticism, see Andrew Stephenson, "Proportional Liability in Australia — The Death of Certainty of Risk Allocation in Contract" [2005] *International Construction Law Review* 64. Note also that apportionment of liability is excluded in some circumstances, for example in cases of personal injury.

The Standing Committee of Attorneys-General has been investigating the possibility of nationally consistent proportionate liability legislation since mid-2006. As Tony Horan argues, the "reform process is an opportunity not just to reconcile inconsistencies, but also to remedy problems with the existing legislation".[11] Of course, even if favourable changes are eventually made, the risk is that contracts will until then be made on shifting sands.

2. SECTION 2: ENFORCING RISK ALLOCATION DOMESTICALLY

As the discussion of proportionate liability makes clear, it is one thing to have a risk allocation agreed in writing between the parties and yet another for a party to be able to take the benefit of that risk allocation. The value of a contractual right that cannot be enforced efficiently is reduced significantly by such inefficiency, often so that it has no value. In ensuring that contractual rights are enforceable, where all parties are based in the same jurisdiction, a prudent party:

(a) ensures that the contractual terms are clear and that they provide a suitable dispute resolution process;

(b) detects and responds to risks promptly and as required by the contract;

(c) engages in dispute avoidance procedures (DAPs) and alternative dispute resolution (ADR) where possible and appropriate; and

(d) where necessary, engages in litigation or arbitration as the contract provides.

Ensuring Contractual Terms Are Clear

Where the parties are involved in a serious dispute, it will be difficult to reach agreement even on how disputes should be resolved.

The contract should provide a clear process for resolving disputes that is no more complex than necessary. If there is a tiered process for resolving disputes, there should be no open-ended steps. Unlike good wine, the longer disputes fester, the uglier they will be. Particular thought should be given to the framework of dispute avoidance and resolution procedures that will apply. The contract should also state what the proper law of the contract is and should, where possible and desired, exclude or include aspects of the law such as implied warranties or the Vienna Convention (Sale of Goods).

Beyond the aspects of the contract directed to disputes, the clarity of the entire contract is critical, particularly where it sets out rights in relation to essential matters like time, cost and quality. The drafting throughout should be in clear, simple language and the contract should be as short as possible. Dealing with the same issues in different clauses creates confusion and often ambiguity or inconsistency. This should obviously be avoided.

Detecting and Responding to Risks

It is important to understand the other party's motivations and to maintain good business relationships wherever possible, no matter what method of contracting has been chosen. However, this does not mean that the contract may be ignored. Those charged with administering the project should have a thorough knowledge of the contract and should regularly refer to it.

Where a risk may become serious, early legal advice is critical to minimising liability and exposure to risk. Early legal advice helps to ensure that the party takes a consistent position and reduces the risk that the other party will claim that it has waived rights or is estopped from asserting them.

Whether or not legal advice is sought, all contractual requirements in relation to the timing and content of notices must be complied with.

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[11] "Key Developments: Proportionate Liability" (paper presented at the Melbourne Law School Construction Law Program 10th Anniversary Function, 10 November 2009) at 3.

DAPs and ADR

The contract may provide for a variety of dispute avoidance procedures and forms of alternative dispute resolution. Which combination of these is appropriate will, naturally, turn on the nature of the project and the parties to the contract.

The most common dispute avoidance procedure is probably the dispute resolution board ("DRB"), which the World Bank habitually uses. The basic concept of the DRB is that, say, three independent and respected experts are appointed early in the project. They then conduct regular site visits and remain familiar with the project across its life. When there are disputes, the DRB is consulted, and within a short time, provides a recommendation. That recommendation is not final and binding, but the track record for compliance with DRB recommendations is good.

Mediation is the most common form of alternative dispute resolution. Mediation at its best can resolve issues before relationships are harmed, and it can encourage negotiation that may lead to solutions that reflect all parties' interests. However, mediation cannot provide a mandatory outcome and is entirely dependent on the parties' desire to reach agreement.

Unlike DRBs and mediation, expert determination can provide a clear decision that the parties may be expected to obey (although there are legal risks in enforcing that decision). Expert determination will be most suitable where there is a matter capable of being appraised by an expert rather than factual or legal issues. Mixed questions requiring a consideration of expert opinion and issues of fact or law are inappropriate for expert determination. Expert determination does not involve a hearing. Accordingly, where there are contested factual questions, the process is singularly inappropriate.

There are many other forms of dispute avoidance procedures and alternative dispute resolution, and those discussed briefly above are only intended to illustrate their approach. The aim, in short, is to ensure that parties can enforce their contractually agreed rights without the formality and cost of litigation and arbitration.

Formal Dispute Resolution

Decisions by properly constituted courts and arbitrators provide binding decisions that are capable of ready enforcement between domestic parties. Both, however, are costly by comparison with other means of avoiding or resolving disputes.

Litigation in Australia provides established rules of engagement, an experienced judiciary and predictable outcomes, with full rights of appeal. Further, even though litigation is costly, the state heavily subsidises court costs. However, litigation is slow, in part because of delays in the court system and in part due to the need for extensive discovery. (The effect of rejuvenated specialty lists like the Technology, Engineering and Construction List in the Supreme Court of Victoria remains to be seen.) The parties have no control over the judge appointed, and the process may be unsuited to complex technical disputes. Finally, court proceedings are very public.

Domestic arbitration is conducted in private, and it allows the parties to choose not only their arbitrator(s) but also the procedural rules to be applied; this ideally allows the dispute to be resolved more efficiently. There are limited rights of appeal under the *Commercial Arbitration Acts*. The parties may see this as an advantage or disadvantage. One obvious disadvantage of domestic arbitration, though, is that the parties must pay for the full cost of the arbitrator and all facilities. This is a particular problem where arbitration unnecessarily mimics court proceedings and so washes away the potential efficiencies of arbitration. Accordingly, the best domestic arbitrations are likely to be modelled on international arbitration.

3. SECTION 3: SPECIAL RISKS WHERE THERE ARE INTERNATIONAL COUNTERPARTIES

A contract that provides for final dispute resolution by way of litigation in a familiar jurisdiction may provide a domestic party comfort. This comfort is misplaced. Where the counterparty is based overseas,

and holds its assets overseas, it may be very difficult (or impossible), expensive and time-consuming to enforce a decision of a domestic court — and it may be necessary to re-litigate the dispute. The outcome for the domestic party is at best uncertain.

International arbitration provides a solution to this question of enforceability through the operation of the New York Convention (the Convention on the Recognition and Enforcement of Foreign Arbitral Awards). Over 140 nations are party to the New York Convention. The grounds on which a party may resist enforcement or seek review of an arbitral award made under the New York Convention are limited. It will generally be a relatively simple matter to enforce the award in a foreign jurisdiction.

Beyond the threshold question of enforceability, international arbitration offers numerous advantages. Some of these advantages are procedural (because of the operation of standard rules of arbitration) and some arise through the culture of international arbitration. These benefits include:

(a) rigidly enforced timetables established at the preliminary conference (which busy arbitrators are unlikely to amend);

(b) greater flexibility with the rules of discovery (allowing cheaper and faster resolution of disputes);

(c) the opportunity to implement efficiency measures like limited time "stop clock" hearings; and

(d) in some cases, a greater capacity to deal with cultural diversity.

PART 3 — CONCLUSION

This article is devoted to the very broad topic of risk allocation in major projects. It could not possibly be exhaustive. Rather, the approach has been to take a single example, that of a process engineering project, and to examine how the parties' decisions and external forces shape the risk allocation.

The method of project delivery and the terms negotiated are paramount. The paper has considered five plausible delivery methods:

(a) Traditional Procurement;

(b) Engineer Procure and Construct (EPC);

(c) Engineering Procurement and Construction Management (EPCM);

(d) Early Contractor Involvement / Managing Contractor (ECI); and

(e) Alliance Contracting.

In the context of a process engineering project, the allocation of risk in relation to time, cost and quality depend on the delivery method. As has been argued throughout, however, the detailed drafting of the final contract can give surprising results. The consequences of misunderstandings and errors regarding insurance are especially severe.

Part 2 of the article emphasised that even if the parties have agreed on the allocation of risks in principle, the contract must contemplate legal barriers to benefiting from that risk allocation. Proportionate liability legislation and the difficulties of efficiently enforcing contracts against domestic and especially international counterparties are just some of those barriers.

The central message is that a practically enforceable allocation of legal risk requires much more than good sentiment and in principle agreement between the parties.

ATTACHMENT 1 — GENERIC RISK ALLOCATION MATRIX

EPC CONTRACT

	Owner	EPC Contractor	Process Contractor	Insurer	Early Works Contractor
Cost of Construction/ Provision of Service					
Defects in Process Design					
Defects in Other Design					
Delay in Completion of Works or Services					
Defects in Construction					
Failure to Complete Process Design on Time					
Failure to Complete Other Design on Time					
Failure to Complete Construction on Time					
Damage to the Works during Construction					