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LAW BULLETIN

Conducting an effective and accurate assessment of project risk

General Editor

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Risk management involves the identification, mitigation and evaluation of risks.¹ The Standards Australia standard on risk management has defined 'Risk Management' as 'the culture, processes and structures that are directed towards realising potential opportunities whilst managing adverse effects' and the 'Risk Management Process' as 'the systematic application of management policies, procedures and practices to the tasks of communicating, establishing the context, identifying, analysing, evaluating, treating, monitoring and reviewing risk'.² While the standard specifies the elements of the risk-management process, it does not seek to enforce the uniformity of risk-management systems and is independent of any specific industry or economic sector. Notwithstanding this, it has increasingly formed the basis for the more sophisticated forms of risk assessment undertaken by parties to major construction projects and sets out the base parameters of the risk-management process.

Analysis and evaluation

Risk analysis is about developing an understanding of the risk. It involves consideration of the sources of risk; their positive and negative consequences; and the likelihood that those consequences may occur. The purpose of risk evaluation is to make decisions, based on the outcomes of risk analysis, about which risks need treatment and treatment priorities. Risk treatment involves identifying the range of options for treating risks; assessing those options; and preparing and implementing treatment plans.

There are two features that characterise risks:

- the probability (chance) by which they can happen; and
- their ultimate impact on the project, if they do materialise.³

An accurate assessment of these two aspects will enable an organisation or consortium to decide on a course of action.

The probability of a risk occurring and its impact on a project are used in tandem as decision aids. For example, if the chance of a risk happening is assessed to be high and its potential impact is equally high, then such risk is accorded high priority. Once these priorities are determined, an assessment needs to be made. Such assessments are usually either qualitative, semi-quantitative or fully quantitative. In a qualitative assessment, both probability and impact are assessed subjectively.

In practice, qualitative analysis is often used first to obtain a general indication of the level of risk and to reveal the major risk issues. Later it may be necessary to undertake more specific or quantitative analysis on the major risk issues.



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Qualitative analysis uses words to describe the magnitude of potential consequences and the likelihood that those consequences will occur. In semi-quantitative analysis, the objective is to produce a more expanded ranking scale than is usually achieved in qualitative analysis, with probability being assessed subjectively but impact assessed objectively. In quantitative analysis, numerical values for both consequences and likelihood using data from a variety of sources are utilised. The quality of the analysis depends on the accuracy and the completeness of the numerical values and the validity of the models used. Consequences may be determined by modelling the outcomes of an event or set of events, or by extrapolation from experimental studies or past data.⁴

Risk evaluation involves comparing the level of risk found during the analysis process with risk criteria established when the context was considered. Whichever way the risks are evaluated, some form of sensitivity analysis is often conducted to identify the most volatile risks — that is, those that have a knock-on effect on the achievement of the project's objectives. In sensitivity analysis, therefore, cumulative influence of the risks on the project's objectives is assessed.

Multidisciplinary approach

The use of a project team to undertake risk analysis appears to be one of the key trends to have emerged in recent years and it is clearly necessary to take a holistic approach that focuses not only on legal risks, but also on the myriad technical, commercial, regulatory and process risks likely to be encountered. Accordingly, a legal risk assessment is likely to comprise only one aspect of assessments which should be made, involving a variety of professionals drawn from other disciplines, both inhouse and sometimes externally.

Clearly, the risks which the various stakeholders consider as most significant to them will guide their focus on risk management, the allocation of those risks and their choice of disciplines called upon to inform their decision-making process.

The perception of risk — what

constitutes a risk in the first place and the reaction of a particular stakeholder to it — will often be informed by past experiences and influenced by value systems, both personal and organisational. Hence, a contractor in a competitive tendering situation may feel that it is being asked to assume risks over which it has no control, while at the same time the principal may consider that those risks have been allocated to the party best able to manage them.⁵ The financier, on the other hand, its perception of risk being driven by the nature of the financing itself and the focus on completion risk, may seek to allocate maximum risk to the contractor for the good of cash flow — insisting on an allocation of risk even more narrow than that which might otherwise have been negotiated between industry participants.

Differentiating between risks that are and are not within the contractual parties' control

Once the key risks likely to be faced by the stakeholders in a major project have been identified, it is important to differentiate between risks that are and are not within the respective parties' control.

The reasons for this are self-evident if one accepts the soundness and desirability of seeking to allocate risks in accordance with the Abrahamson principle — that is, the decision as to whether or not a party should ideally bear a risk will be in part a consequence of the determination of whether that risk is one within the party's control.

If one is to assume that 'bad' risk allocation (in the sense of a party being required to assume a risk over which it has no control or for which it is not adequately compensated or motivated to assume that risk) lies at the heart of much of the expensive and time-consuming litigation and disputes which arise out of construction projects, the necessity to assess accurately which risks do or don't fall within a party's control becomes clear. There are, however, other important consequences that may flow from the inability to identify correctly which risks do or don't fall within a party's

control, including the following.

- The bankability of the project may be affected (that is, a project financier may be unhappy to proceed if it feels significant risks are being borne by a project participant who may not have the wherewithal nor the ability to control that risk).
- The principal may be paying an inflated price for the project, as a result of loading unnecessarily (from the principal's point of view) built into the tender prices, as a result of the tenderers being asked to price a contingency over which they have no control.
- The ability of that party to procure the requisite and appropriate insurance, or even to determine whether insurance is required with respect to a particular risk or whether that risk is better managed via that party's internal risk-management processes, may be hampered.
- There may be an inability to determine which risks should be shared. Risks that are outside the control of both contractual parties may be the ones best shared; for example, the risk of inclement weather may be one agreed to be borne by the principal in a time sense, but in a cost sense will be the contractor's risk. Shared risks outside of the control of each party with financially significant consequences may also be the ones transferred to a third party, such as an insurer, in order to provide balance sheet protection.

Treatment of risks

Treatment options for risks having positive and negative outcomes can be similar, although the interpretation and implications are clearly different. Often the consequences of both positive and negative outcomes can be dealt with by way of risk sharing and a 'pain/gain' model commonly seen in forms of alliance and relationship contracting. Where dealing with negative outcomes from risks identified and having to treat those risks in the context of a more traditional contract structure, risk mitigation is called into play, this

being the process of finding solutions to counter risks. Instead of simply pricing for risks, there are other opportunities for mitigating risks, including:

- risk elimination (for example, not proceeding or proceeding on a different basis);
- risk reduction (for example, by undertaking further investigations/due diligence);
- risk transference (for example, by legal, contractual and insurance); and
- risk retention (for example, self-insurance, bearing a large deductible and the internal management of risk).⁶

Often these mitigation strategies, particularly risk transference, are given effect contractually via the use of such means as contractual exclusions, limitations of liability, indemnity clauses, risk transference, guarantees, performance bonds and insertion of a risk premium.

From a legal adviser's perspective, having identified critical areas of concern in relation to risks that a client is being asked to assume and proposing options for treatment of those risks, it is of course imperative that the ultimate legal documentation accurately reflects the treatment of those risks as agreed between the parties, as well as giving effect to the agreed risk allocation.

Ensuring that risk factors are costed in appropriately and understanding which aspects of risk allocation are primarily market driven

The reality is that, as a result of inequality in bargaining power and the desire of contractors in a competitive market to secure the project, risks are not always allocated to the party best able to manage them and there is not always the ability to insist upon an appropriate risk premium in exchange for having taken on that risk.

Clearly, one of the key factors in ensuring that risk factors are costed in appropriately (or at very least understanding the risk factor being assumed without requisite compensation) is first the accurate identification of risks and then an

appropriate assessment of both their likelihood and their consequences. The use by contractors of their own 'base case' estimates, with their constituent parts being broken down and subject to percentage-based optimistic and pessimistic outcomes, can often be the basis to arrive at an overall risk premium in arriving at a final bid price.

While initially it may be the case that risks are assessed from several dimensions, these considerations are subsequently translated into financial terms. In terms of appropriately 'costing in' risk factors, different organisations will use different approaches. After assessing every risk, an organisation may identify those risks with a high probability and/or impact and then price its full impact into the bid. Another — and arguably more realistic — approach is to price all identifiable risks, but to seek to control their cost consequences through probabilistic considerations.

For example, if the probability of encountering certain ground conditions is assessed at 20 per cent and the cost of contending with those conditions is estimated at \$200,000, a contractor — rather than ignore the risk altogether and potentially leave itself exposed, or building in the full \$200,000 into its bid price and thus potentially rendering its bid uncompetitive — may elect to price the risk in accordance with a simple formula to determine risk cover, such as: $0.20 \times 200,000 = \$40,000$.⁷

The effect of each risk (where the probability of it occurring is uncertain) is treated accordingly, and the cumulative effect will feed into the final bid price and act as the contractor's 'risk buffer' or 'risk premium'.

The reality is that this risk premium is often eroded during the course of the 'sharpening the pencil' discussions at the preferred-tenderer stage of negotiations. Moreover, the ability of contracting parties to adopt innovative risk management and transfer strategies can in a very real sense be impacted upon by the involvement of a project financier who will see completion risk as one of the key drivers.

Looking at where risk allocation is heading

There are a number of developments impacting, or likely to impact, upon approaches to risk allocation and risk management going forward.

There has been a rapid convergence between insurance and financial markets in recent years. In the same way that the reinsurance market has been developing the concept of catastrophe bonds, financial engineers should ensure new and innovative ways to lay off risk via accessing the pool of worldwide capital now looking for a home.

The emergence of the financial engineers themselves and their heavy involvement in major infrastructure consortia may increasingly see the risk/reward profile determined less by an assessment of traditional construction risk, and more by the ability of the project to service the facility and meet the requisite financial return, and by the management of completion risk.

There is also the somewhat disturbing emergence of potential uncertainty created by legislative intervention (for example, legislation concerning security of payment and proportionate liability), which may have the effect of cutting across the carefully negotiated allocation of risk and, accordingly, may threaten the involvement of parties, once again principally financiers, in projects.

The trend away from some of the more traditional modes of project delivery has challenged the approaches of some parties that have historically sought to transfer risk by the use of indemnities and insurance. Clearly, these are inappropriate in project alliance agreements — for example, where the principal will often accept design risk and the risk of associated cost overruns and may be met with reluctance on behalf of insurers to cover such risk in circumstances where it is ultimately within the control of others.

Similarly, the move towards partnering and relationship contracting and the uncertain legal status of a partnering charter (and the potential obligations arising therefrom

— good faith, etcetera) may, while militating against some traditional risks, see new ones emerge.

The so-called ‘insurance crisis’, coupled with the shrinking availability of insurances in the immediate aftermath of 9/11, have certainly led to astute commercial organisations assuming far greater responsibility internally for the management of risk, and this can be observed in the growing legal and risk teams of our major contractors and engineers. The use by some large corporations of ‘captives’ and the very significant deductibles being borne by most contracting organisations have seen a renewed focus on risk assessment and management at an early stage of projects, although empirical data as to the effectiveness of these processes is not yet readily available.

It is also worth noting that since 2000, Australia has seen the emergence of private finance initiatives (PFIs) in the form of public–private partnership (PPP) procurement by governments. Given that the justification now given for such proposals is value for money by the achievement of optimal allocation of risk, an extensive risk assessment is called for — first to determine the Public Sector Comparator (PSC), and then to accurately assess the proposals being put forth by interested parties. These PPP participants will necessarily have to consider risk right through from conception to operation and termination. While the overriding principle in PPP procurement is that risks should reside with the party best able to manage them, in reality it has tended to be only demand-related risks that are retained by the public sector.

As a final observation, it remains the case that no amount of risk

assessment, management and treatment will guarantee that issues with serious financial and other consequences will not arise during the course of what is a dynamic and inherently risky enterprise. Accordingly, the attention increasingly being afforded to the careful drafting of dispute resolution clauses and innovative modes of dispute determination within the project documentation itself is to be welcomed. ●

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Endnotes

1. Steele A *Audit Risk and Audit Evidence: The Bayesian Approach to Statistical Auditing* Academic Press, London 1992.

2. 1.3.20/1.3.21:AS/NZ4360:2004 ‘Risk Management’ at pp 4 and 5.

3. See Chinyio E and Fergusson A ‘A construction perspective on risk management in public–private partnership’ in Akintoye A, Beck M and Hardcastle C (eds) *Public–Private Partnerships — Managing Risks and Opportunities* Oxford, Blackwell Science 2003 p 105.

4. AS/NZS 4360:2004 3.4.4(a) and (b).

5. As suggested by the results of the 2001 survey conducted by the WA Chamber of Commerce and Industry and the Institute of Engineers Australia: Yates A and Sashegyi B *Effective Risk Allocation in Major Projects: Rhetoric or Reality?* (2001), available at <www.engineersaustralia.org.au/representation/publications/infrastructure/infrastructure_home.cfm>.

6. Chinyio and Fergusson, above note 3, p 114.

7. Above, at p 109.

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