

A PUBLIC SECTOR APPROACH TO RISK MANAGEMENT AS PART OF A TOTAL ASSET MANAGEMENT STRATEGY

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There is a clear willingness on the part of public sector clients to strive for best practice in the management of their assets. This is evidenced through initiatives such as those undertaken by the Department of Public Works and Services (DPWS) New South Wales, in its total asset management strategy. A recent research project undertaken by the Department of Building at the University of Newcastle in co-operation with DPWS reviewed and evaluated risk management practices in public sector projects with respect to stated policy, current total asset management strategy and best practice benchmarks.

The study had two objectives firstly to compare the DPWS risk management guidelines against other industry and theoretical risk management models and, secondly, to obtain feedback on current risk management practices within the DPWS, with particular reference to the application of the risk management processes contained in the Total Asset Management Manual (TAMM).

The study of risk management models demonstrated that the DPWS model had comparable features to private sector models. The review of DPWS risk management processes raised a number of issues related to the inclusion of key stakeholders in the decision making process in complex public sector projects.

Keywords: Best practice, cultural shift, total asset management, risk management, stakeholder involvement.

BACKGROUND

Clients of the construction industry are being exhorted to exert more influence on the quality of the final product and to take a proactive approach in the construction process itself. This is not a new phenomenon. For many years the construction industry has been criticised for its perceived inefficiencies and over the years many inquiries and reports have been directed at improving resource utilisation in the industry. In the UK these reports and inquiries have ranged from the Simon Report (Central Council for Works and Buildings, 1994) the Emmerson Report (Emmerson, 1962) and the Banwell Report (Committee on the placing and management of building contracts, 1964), culminating in the Latham Report (Latham, 1994). In addition, reports such as 'A fresh look at the UK and US Industries' (Flanagan, Norman, Ireland & Ormerod, 1986) 'Controlling the upward spiral - Construction performance and cost in the UK and mainland Europe' (The Business Round Table, 1994), 'Building Britain 2001' (University of Reading, 1988), 'Strategies for the European construction sector: A programme for change' (European Commission, 1994), have increased pressure for change in the UK construction industry. In the southern hemisphere pressure has been exerted through the Gyles Royal Commission into

Productivity in the Building Industry in New South Wales (Gyles, 1992) and the Construction Industry Development Agency, Reform Strategy (CIDA, 1992) both of which preceded Latham.

The dominant message from both Latham's final report and Gyles's royal commission report is the key role of the client in activating a cultural shift in the industry through the adoption of world's best practice. This is summarised by Latham who states that 'implementation begins with clients. Clients are at the core of the process and their needs must be met by industry'. Latham recommends that 'Government should commit itself to being a best practice client. It should provide its staff with the training necessary to achieve this and establish benchmarking arrangements to provide pressure for continuing improvements in performance.' This has been expressed more succinctly if more crudely, as 'the client having the power of the cheque book'.

In his report, Latham makes mention of the Australian approach to cultural change through CIDA (Construction Industry Development Agency). CIDA was an Australian Federal Government initiative, set up under the Construction Industry Reform and Development Act of 1992. CIDA's remit was to bring about a 'real and measured change'. CIDA had a fixed life which expired in June 1995. A legacy of CIDA has been, amongst other things, a Code of Practice of prequalification criteria. Although CIDA is no longer extant, Australian State Government Authorities such as the New South Wales Department of Public Works and Services (DPWS) continue to actively promote best practice. Following the Gyles Royal Commission in 1991/92 the New South Wales Government moved rapidly to put two major policy documents in place. These were the Capital Project Procurement Manual (NSW Construction Policy Steering Committee, 1993) released in October 1993 and the Total Asset Management System (NSW Public Works Dept. Policy Division, 1993) released in November 1993. The policy documents are linked, with the Total Asset Management Manual (TAMM) providing the strategic investment framework and ongoing management parameters and the Capital Procurement Manual focusing on the asset acquisition and renewal procedures. The pilot study described in this paper focuses on the risk management component of the TAMM.

RISK MANAGEMENT: THE DPWS PERSPECTIVE

From 1993 onwards NSW Government agencies were required to adopt a structured and systematic risk management process within their asset and capital works management procedures. The current policy for risk management requirements for public sector projects are :

- | | | |
|----|---------------------|---|
| a) | Designated projects | Risk management plan required |
| b) | \$5m - \$20m | Identify risks and prepare management responses |
| c) | Less than \$5m | No formal requirements |

Risk management requirements for other than designated projects are integrated with other policies and procedures contained in the TAMM.

THE PROJECT

In 1997, a research team from the Department of Building at University of Newcastle received funding from the Australian Research Council to undertake a research study with the following remit:

“A review and evaluation of risk management practice in public sector projects with respect to stated policy, current Total Asset Management strategy and best practice benchmarks”

DPWS INVOLVEMENT

Support from the NSW Department of Public Works and Services was provided in the form of :

- identification of suitable cases for analysis
- access to decision makers and project records relevant to these cases for data collection

Research Objective One : Comparison of TAMM with other risk management models

The following Figure illustrates the TAMM risk management system. This comprises a five stage process of proposal familiarisation, risk analysis, response planning, reporting and implementation underpinned by a conventional three tiered risk management model of risk identification, risk analysis and risk response.

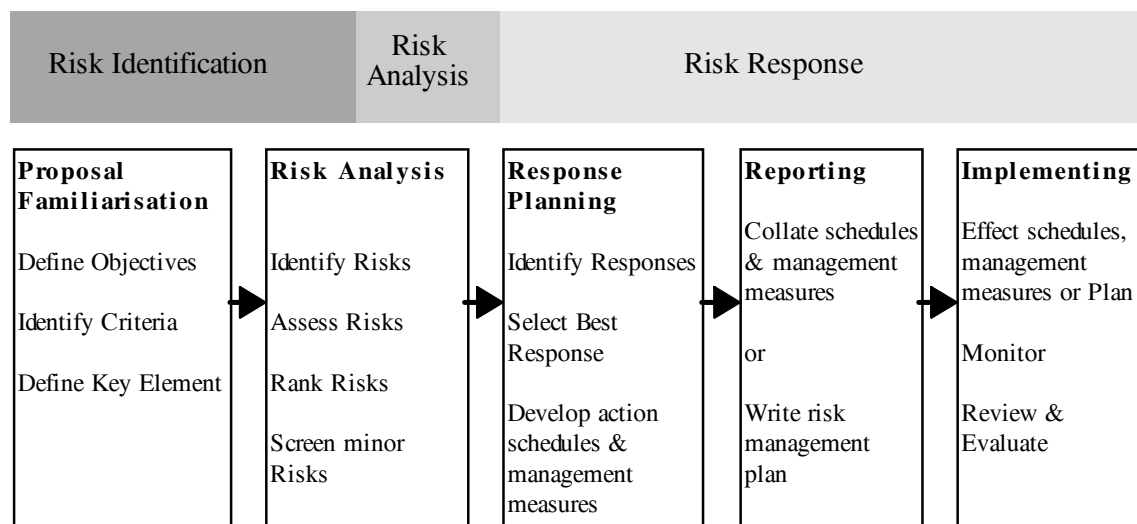


Figure 1: The TAMM Risk Management System : a 5-stage process

COMPARISON OF TAMM GUIDELINES WITH OTHER MODELS

The TAMM’s guidelines for the risk management process were compared with practices within and outside of the construction industry. Comparisons were carried out with the practices of a multi-national primary producer, a major oil company, a national building contractor and the Construction Risk Management System CRMS (theoretical) model.

For reasons of confidentiality, and also in the interests of brevity, detailed comparisons with the first 3 benchmarked organisations have not been included in this paper. The comparison with the CRMS model has been included in detail as a demonstration of the methodology used and the nature of the comparisons undertaken.

Construction Risk Management System - CRMS

The Construction Risk Management System (CRMS), is based on a conventional three tiered risk management model, and in this respect has the same parentage as the

TAMM approach. It was devised by J.F. Bahar (1988) and utilises quantitative techniques, for identifying, evaluating and responding to risk.

The following Figure illustrates the CRMS system. This comprises a four stage process of risk identification, risk analysis and evaluation, response management and system administration.

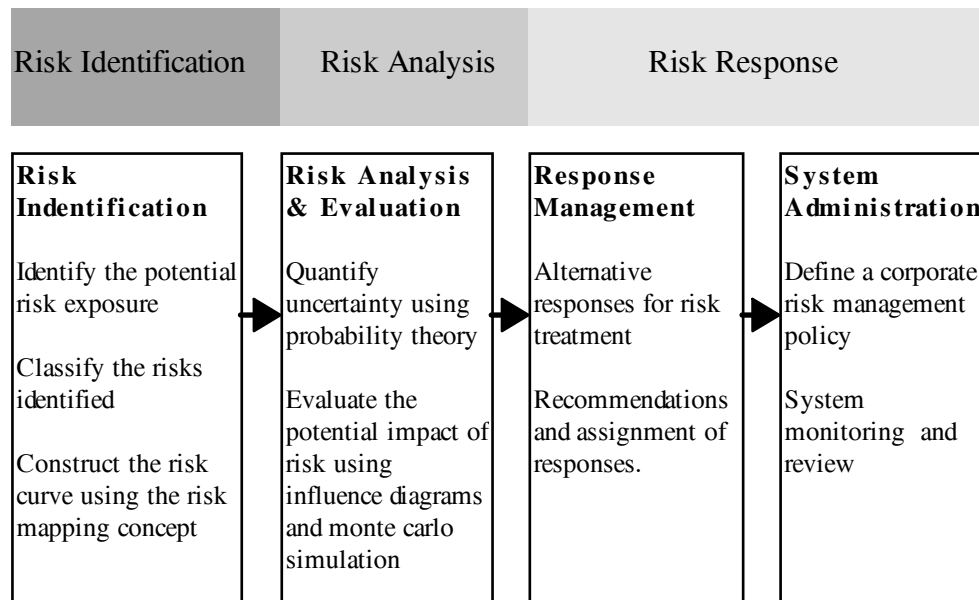


Figure 2: CRMS Risk Management System: a 4-stage process

A notable difference between the CRMS model and other construction risk management models considered in this study, is the systematic administration component, combined with the analytical techniques recommended to analyse the risks identified.

The CRMS model is distinguished because it:

- has an orderly and consistent approach to risk management
- uses an objective method rather than the traditional intuitive approach, with results able to be proven and documented
- utilises systematic risk management which analyses and evaluates risks
- contains a feedback loop that exists in the form of the system administration component, to enable the information within the system to be updated and also to capture the interaction between these procedures
- includes an integration element that links to the organisation’s overall risk strategy

The CRMS model is not intended to be applicable to all size projects and was devised as formal structured approach for contractors. The model has difficulty in terms of its dynamics with the complex processes within each of the four functions tailored to larger projects. This is in contrast to the TAM risk management system. Similarities exist between the CRMS system and the TAMM risk management guidelines.

In comparison with the TAMM guidelines, the CRMS model does not include a proposal familiarisation stage. Instead it refers immediately to the existence of uncertainty and refers immediately to the risk identification stage. One notable difference between the two risk management systems is with respect to risk

identification. Within the CRMS system, risk identification, is kept separate from risk analysis and evaluation. This is in contrast to the TAMM where risk identification is included as part of analysis. As part of this separation of risk identification and analysis, the CRMS places more emphasis on the risk identification activity of the process.

OVERALL COMPARISON

The TAMM risk management guidelines generally compare well with the chosen benchmarks of the theoretical CRMS model, and also compares favourably with practices in the other three benchmark comparators with the exception of;

- implementation actions specified in the system used by the multi-national primary producer;
- the commercial focus and holistic structure of the system used by the national oil company;
- completeness of the strategic/detailed focus of the major contractor's risk management system that addresses all the stakeholders of a project and not just the client's needs.

RESEARCH OBJECTIVE TWO: FEED BACK ON CURRENT DPWS PRACTICE

Method

A total of 7 case studies of substantially completed projects (post-occupancy) from the various categories of projects were analysed with respect to :

- risk identification and analysis methods used
- extent to which identified risks were encountered and effectiveness of planned responses
- extent to which unidentified risks were encountered and impact (time, cost)
- extent to which periodic reviews contributed to improved risk management performance

Data collection and analysis

Data collection and analysis were conducted in 2 stages. In the first stage, primary decision makers involved in risk management planning from each case study were interviewed to:

- ascertain the process and methods of risk identification and analysis used;
- ascertain the obstacles and problems encountered in risk management planning with respect to risk identification and analysis;
- obtain feedback on how in each case, the process and method could have been improved to obtain better risk management performance.

In the second stage, data were obtained through "post-mortem" reviews of project files maintained by the DPWS and the particular agency involved. The data were used to obtain objective measurements of risk management performance and to track identified and unidentified risks encountered in the project.

For designated projects, the risk management plan and subsequent reviews were used for data on risk analysis. For other projects, this data were gleaned from the risk analysis workshops, economic appraisals, monthly progress reports and other project files.

Nature of the data

Not all of the case studies applied the risk management guidelines of the TAMM. Notably, Case Studies Six, and Seven were not confined to the policy requirements in applying the manual.

Case Study Six, had begun prior to the publication of the TAMM. However, this project served as an example of how the principles of risk management were dealt with prior to the publication of TAMM. This consequently allowed comparisons to be made about the differences prior to current policy. Within the context of the TAMM, Case Study Six, would fit into the \$5 - \$20 million category.

Case Study Seven, served as an example of a capital works project which was outside the policy requirements set down by TAMM. Case Study Seven was not managed by the DPWS, and therefore was not obliged to apply TAMM risk management guidelines. This project, however, was included as an example of a joint NSW State Government / private sector project, which has applied the TAMM risk management guidelines. In the context of the TAMM, Case Study Seven would be defined as a Designated Project or a Project over \$20 Million.

Case Study One was below the \$5 million mark and therefore had no formal requirements with respect to risk management. Every other case study was greater than \$5 million in value and therefore required formal risk management actions to be taken.

Each one of the cases studied carried out their formal risk management requirements via a workshop. The workshop was the main formal procedure for the implementation of the risk management process on public sector projects examined. The workshop process was used to initiate the three principles of the risk management process viz. risk identification, risk analysis, and response planning.

Each workshop was conducted over one day, except for Case Study Seven when the workshop took place over two days. Each of the workshops, except Case Study Six and Seven, were concerned purely with construction related risks involved and excluded asset risks. In contrast, Case Studies Six and Seven were concerned with the risks from both the asset and construction perspective.

In no case was the head contractor or sub-contractors involved in the process. Neither was any head or sub-contractor from any of the case studies provided with a copy of the risk management reports or plans. Thus there was no link with any of the risk management work done and the builder. It was confined to supervising staff (representatives of DPWS), and the agency involved. In most cases. the contractor had not been selected prior to the risk workshop.

INTEGRATION OF ADDITIONAL TAMM PROCEDURES

The majority of projects, above \$5 Million, have incorporated other TAMM management procedures including value management, some post-occupancy evaluation initiatives in the form of Component Design Range (CDR) standard drawings for Case Study One, and a number of economic appraisals.

The fact that the much of the risk management process was conducted within a group situation was a point of concern. There was a perception of the phenomenon of “risk shift” which the group decision making processes encourage, which were not always viewed as positive and can have negative impacts on the risk management process. This phenomenon is that ‘groups tend to gamble more than their individual members do if each were making the decision alone’. Although decision making groups allows individuals to outline their concerns, the use of risk management workshops, means that people were analysing risks, and making decisions in a group situation where they were likely to make decisions that they may not accepted individually.

OBSERVATIONS DRAWN FROM THE CASE STUDIES

- the three principles of the risk management took place within a workshop scenario. In the majority of situations, the DPWS has been outsourced by the individual Government Agencies involved to conduct the risk management planning. It is from this point that the practical implementation of how to manage identified and analysed risks is decided.
- neither the head contractor, nor any sub-contractors were invited to attend these workshops, nor were they provided with a copy of the completed risk management plan at any time over the life cycle of the project.
- the procurement choice within each of the case studies conducted was carried out prior to any risk management studies taking place and by people other than the project managers involved in the individual projects. This procurement choice is decided authoritatively, and consequently predetermines the sharing of risks by the project participants.
- the management of the majority of projects took place in two phases. The risk management planning and the majority of important decisions being made early for each project at the head office of the DPWS. Project management was then handed over to the local section of the DPWS responsible for administering the construction stage which involved new personnel and little further involvement from the original project team. This can lead to a loss of continuity in effective risk management.
- unidentified risks were encountered within each of the case studies leading to either time, cost or quality impacts.
- no formal briefing on the risk management guidelines or training in the use of particular techniques and methods had taken place. In each of the case studies, the use of the manual has been based on the individuals’ interpretation of the guidelines, practical experience in facilitating risk management workshops, and often out of the risk workshop facilitators’ own desire to utilise this management tool for their own benefit.
- the risk management guidelines compared adequately with conventional risk management theory, and in comparison to identified industry practice and theoretical models.
- the risk management guidelines seem to be gaining greater acceptance within the DPWS and associated agencies, especially with respect to larger projects.

FUTURE RESEARCH AREAS

A number of areas have been identified for possible further research:

- To study more cases, including those categorised as designated projects or greater than \$20 million, so as to gain a greater understanding of the issues involved and the practical use of risk management in conjunction with the risk management guidelines at this level.
- To carry out ‘practical’ benchmarking (rather than theoretical) of industry best practice risk management be carried out to compare practice with practice, and process with process.
- To refine the risk management guidelines focusing on expanding quantitative techniques and the implementation of management responses, reviews and the future administration of risk management in conjunction with integrated management practices. The DPWS are integrating a number of management practices from the total asset management manual however at present little is known about the extent of integration or the outcomes being achieved.

DISCUSSION

As stated at the onset, the DPWS is a leading exponent in Australia in the adoption of best practice approaches to the large scale management of assets. The fact that DPWS are prepared to conduct research into the effectiveness of their total asset management strategies is indicative of their quest for continuous improvement. The pilot study has demonstrated that the theoretical framework adopted appears sound, if viewed purely in the perspective of a self contained approach to risk management. However the study has also demonstrated the major hurdles which need to be overcome in developing an all encompassing model. The resolution of issues for a government agency of probity versus the early involvement by stakeholders with commercial and often conflicting interests is a perennial problem. This is illustrated by reference to the Pareto influence curve in Figure 3.

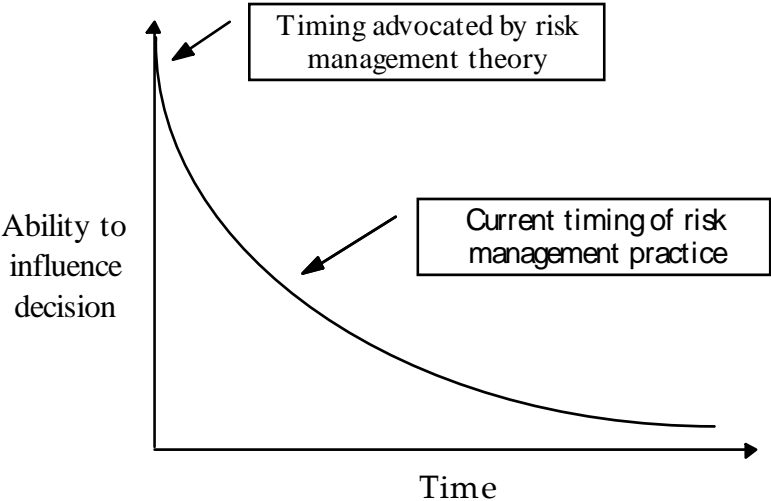


Figure 3 Pareto curve illustrating exponential relationship of time to decision making.

Consideration has also to be given to the fact that risk management is only one component of the TAMM whose guidelines include a range of activities from

economic appraisal, value management and energy management to heritage assets and asset like costing. Risk management, in addition to being an identified component of the TAMM, also permeates all of the other components contained within the TAMM thus illustrating the magnitude of the challenge for total asset management strategists. Whether this type of challenge is responsive to a 'total' (assuming that total infers holistic) approach is perhaps a mute point. McGeorge and Palmer (McGeorge & Palmer, 1997) have disputed whether or not the systems theory advocacy of early stakeholder involvement is in fact feasible or practicable in the simultaneous application of modern management concepts. In their view "the problem (i.e. the problem of converting stakeholder involvement from theory in practice) lies in the conflict which can arise when a large number of management concepts compete with one another for the prime position at the origin of the x,y axis."

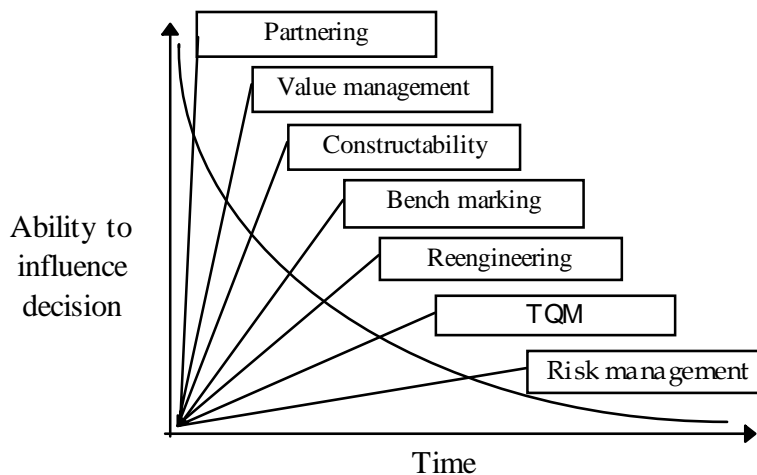


Figure 4: Competition at origin of Pareto curve for stakeholder involvement

The most important area of future research which we have identified is that, whilst the DPWS are integrating a number of management practices from the total asset management manual, at present little is known about the extent of integration or the outcome being achieved. We believe that much is needed to be done in developing integrative models before comprehensive stakeholder involvement can be achieved in risk management and allied total asset management activities.

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