

Collaborative Risk Management Guidance

November 2005

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Foreword

This guide has been written to provide an introduction to risk management for construction practitioners and in particular how they should participate in the collaborative management of risk between companies.

Risk is often transferred by one entity and accepted by another without any discussion between the parties on the nature of the risk or the advisability of transferring it. Risk is often assumed to have been transferred when a subcontractor agrees to carry out an operation for a main contractor. This can result in a dispute when a risk event occurs and it is discovered that there is no shared understanding of the risk that was transferred, or even if it was transferred. The identification of risks should precede the pricing of any work.

It is only when companies work closely and in an open fashion i.e. collaboratively, that a joint understanding of the risks inherent for each party in the design and delivery of a construction project is gained. As a result, all affected parties can collaboratively manage the risk and an improved outcome is assured.

At the time of writing there is a wide gulf between the risk awareness of the largest and most expert companies, and the smaller companies that undertake much of the construction activity. This guide seeks to narrow that gap by providing simple explanations to those who need to comprehend risk management and its impact on their business. This understanding will allow them to participate in mature discussion of the nature of the risks facing them within the supply chain and also provide the means of managing them.

Sandy Mackay

November 2005

Introduction

The BE Collaborative Risk Management Guide has been developed through the Be Collaborative Risk Management Group, whose membership comes from the whole spectrum of Construction Organisations.

Risk management is not a process that is solely for large contracts or for major organisations. The successful management of project risk benefits *all* members of the construction supply chain, whatever the size of the project or organisation. Project risk management is becoming a standard requirement in construction projects, with many public and private sector organisations now making it an integral part of the contractual requirement.

The purpose of this document is to provide the reader with an introduction to the Project Risk Management process and to show how risks can be managed in a more collaborative manner. In addition it aims to provide the reader with a set of links where further guidance may be found.

The approach to Risk Management that an individual organisation adopts should not impose undue financial burdens on it. Many organisations will have been successfully managing risk for many years albeit in an instinctive manner. The process contained in this guide seeks to promote a standardised formal approach to risk management that should improve the outcomes for organisations that apply it and also enable discussion of risk between companies.

The risk management process has to involve all the people involved in or affected by the project (the stakeholders) and the starting point of the risk reviews has to be for them, working as a group, to gain a thorough understanding of the project objectives. The identification and formal review of risk in an open forum will assist in ensuring the project team understands the potential consequence of the risks that must be managed. It will also show that by successfully managing the risks, many benefits can be brought to the project.

The project risks and the stakeholders who are involved will change throughout the life of the project and therefore the risk register must be reviewed at regular stages throughout the project. The risk register is a crucial project document and must be open to all who work on the project and it must also be added to by new participants as they become involved. By comparing risk registers across projects and reviewing them throughout the duration of a project, the collaborative approach by all the stakeholders benefits both the project and the companies participating in it.

Risk Management: The Good, the Bad and the Ugly

A Contractor was appointed to construct some large caissons for the MOD. The caissons weighed in excess of 600 tonnes and were to be delivered to one of the Royal Navy Dockyards by sea.

The chosen contractor was based on the East Coast of England. The contractor had many years of experience building large steel structures for the North Sea offshore oil and gas industry, with some of the structures weighing in excess of 10,000 tonnes. Therefore the construction and transportation of a 600 tonnes caisson was seen initially as a straightforward project.

The Contractor developed a method statement as part of his bid submission and in simplistic terms it set out that the caisson would be built in the horizontal plane and once complete the caisson would be loaded onto a semi-submersible barge for delivery.

However prior to the commencement of construction of the caisson a Risk Workshop was held to discuss the project. The workshop included not just the designer and constructors but also representatives of the MOD including the Dockyard Basin Manager.

The workshop concluded that there were two key risks in connection with the transportation of the caisson

- 1 Any delay in delivery due to bad weather would incur the contractor high cost due to the daily hire charges of the barge (circa £20k per day)
2. Naval ship movements within the dockyards might inhibit the ability to offload the semi-submersible; any additional hire cost would also be to the contractor's account.

Changing the method of delivery by the use of flotation aids and towing the caisson with a tug mitigated these risks. This action alone reduced the potential financial risks to the contract. However this change also required the caisson to be built in the vertical plane. As the works had not started this incurred no additional cost to the project. However, if this had been highlighted at a later time then the cost would have been substantial in terms of the cost of the craneage and additional supporting steelwork that would have had to be installed into the caisson.

The caisson was successfully constructed with some delay in the delivery due to bad weather. Once at the dock yard, whilst the Contractor was unable to deliver the caisson into the basin due to military restrictions, the MOD were able to take it over with three of their own tugs and position the caisson outside the basin at no additional cost to the contractor.

Risk Management

A principal intention of this guide is to provide a standard approach to Project Risk Management, and a key to this is in standardising the terminology used.

Risk is generally defined as being the combination of the probability of an event and its consequence. Risk Management is the process where an organisation identifies, prioritises and develops management action to control the risks. The risk management process should not be treated as a separate process but be embedded into the culture of the organisation and continually reviewed and reassessed throughout the project lifecycle.

The Risk Management Process

The Risk Management Process can be divided into a number of distinct sections

- Risk Management Planning
- Risk Identification
- Risk Evaluation and Assessment
- Risk Handling
- Risk Retention
- Risk Reporting
- Risk Management Plan

1. Risk Management Planning

As part of the initiation of a project, a risk management plan should be developed. A project for this purpose should be considered in the widest possible sense and can include a construction project, a bid for work or any other business activity e.g. upgrading of a company's IT systems, office relocation.

The Risk Plan should include as a minimum the following:

- I. Scope of the Risk Study
This should set out the nature of the study that will be undertaken i.e. qualitative or quantitative. If the study is to be of a quantitative nature then consideration needs to be given as to whether this review should be undertaken purely on cost or time or whether both need to be analysed
- II. Identification of Project Stakeholders.
A Project stakeholder should be considered as any party who can influence the outcome of the project, either positively or negatively. The stakeholders to the project will therefore change as the project progresses, as that party's ability to influence the outcome of the project through the project cycle changes.

It is essential that all current project stakeholders contribute to the continuing risk management process. This ensures that a comprehensive set of risks are identified and that a balanced set of views are included when considering the ownership, probability and impact of the risks. It is important that the number of participating

stakeholders is controlled, so some will be in the position of speaking on behalf of others under their control.

- III. Set the timings of reviews of the Risk Register.
The risk register that is developed for the project should be reviewed regularly. Typically the key project risks should be reviewed at the regular project team meetings. In addition a formal review should be undertaken at key stages of the project. This could be at key points within the design e.g. following completion of the appropriate RIBA design stage, and key stages within the procurement process (e.g. appointment of key Contractor and Sub-contractors) or at the completion of principal project stages.
- IV. Identify Project Risk Manager/Co-ordinator
Whilst it is recommended that any Risk Management Workshops should be undertaken by an independent facilitator, a Project Risk Co-ordinator should be identified within the project. In the case of smaller projects this does not have to be a full time role. The project risk co-ordinator will be responsible for the day to day up keep of the project risk register and for compiling the Risk response sheets showing the actions taken for the regular project meeting. In addition the project risk co-ordinator would arrange that the risk management reviews take place in accordance with the Risk Management Plan.

2. Risk Identification

The process of Risk Identification is fundamental to the process of Risk Management. The identification should be carried in a structured manner with outputs fully documented. The process of Risk Identification can be carried out using many methods, two of the most commonly used are:

- Checklists
- Risk Workshop

Checklists

Checklists can be developed for a single project or a series developed for elements of a project. However care should be taken in using standard checklists for identification, as risks specific to a project may not be considered or identified. If checklists are used then project specific issues should be considered and the appropriate risks added to the standard checklist.

A Risk Workshop for the Project Team.

Risk Workshops are considered to be a very effective way of identifying risks to a project. The risk workshop will use a “Brain Storming” technique to identify the risks to achieving a successful outcome of the project.

The “Brain Storming “ should be conducted in a structured manner using either an agenda agreed in the pre planning stage or the breakdown structure of the work for the project. It is important that the identified risks are fully recorded.

An experienced risk facilitator should facilitate the workshop, this can be either someone within the organisation or an external consultant. Where it is proposed to use an internal facilitator it is recommended they have some independence from the project to avoid bias and the facilitator should be experienced in Risk Management facilitation. In the absence of a risk facilitator, a person experienced in facilitated workshops could

be used, but the output will take longer to achieve and additional sessions may be needed to achieve a reasonably complete risk register.

A softer benefit of the use of a Risk Workshop is that in the early stages of a project it is an excellent team building event. The full Project Team should be assembled and are able (and encouraged) to openly discuss concerns they have with the delivery of the project. This encourages collaboration and assists in creating an open culture between the companies and individuals working on the project.

Risk Management: The Good, the Bad and the Ugly

A Risk Manager received a telephone call from a Project Manager on a large commercial development. He explained to the Risk Manager that his project was coming to an end and he was being transferred to a new project. He went on to explain that at the commencement of his current project, some 18 months earlier, he had undertaken a risk workshop for the project and would like to undertake one for his next project. The Risk Manager thought he had found a true "Risk-Convert", who had adopted the process and then seen the full benefits that the process can bring. However this thought soon passed when the Project Manager went on to explain that he was sure that he had a copy of the Risk Register that had been produced somewhere and he would try to find it to see if any of the identified risks had occurred.

The Project Manager had gained some of the benefits of Risk Management but clearly not all. The workshop had helped the project team gain a better understanding of his project aims and assisted in building the project individuals into a team. If he had used the register as a tool to manage the risks, assisting in his decision making or setting the appropriate levels of contingency for his project he would have clearly gained the full benefits.

The risk register was not reviewed during the course of the project, and the risks that were identified at the beginning of the project would have changed through the construction life cycle. Furthermore the learning from the risks that had been successfully mitigated would have been recorded for future reference on his next project.

3. Risk Evaluation and Assessment

The purpose of risk assessment is to be able to rank the identified risk in order that management focus can be directed to those risks that are of the highest priority.

This can be achieved using a simple 5 point scoring system for likelihood of occurrence and impact, an example of which is set out below. It should be noted that the values for cost and time impact are related to the overall cost and duration of the project and will need to be adjusted accordingly for each project.

Probabilities

Scale	Probability	Likelihood	Frequency	Score
Vhi	Almost Certain	> 90%	> Every month	5
Hi	Likely	75%	Every 1-6 months	4
Med	Possible	50%	Every 6-24 months	3
Lo	Unlikely	25%	Every 2-5 years	2
Vlo	Rare	< 10%	< Every 5 years	1

Impact

Scale	Description	Cost	Time	Image Effect	Score
Vhi	Catastrophic	> £5m	> 6 months	National Media	5
Hi	Major	£1m to £5m	3 to 6 months	Regional Media/ National News Paper	4
Med	Moderate	£250k to £1m	1 to 3 months	Local Papers, Radio and House Journal	3
Lo	Minor	£50k to 250k	1 week to 1 month	Multiple Customer Complaints	2
Vlo	Insignificant	< £50k	< 1 months	Single Customer Complaints	1

Once the risks have been scored, the appropriate Risk Score for Probability and Impact can be applied. The product of these two values will give a Probability Impact Score (PI) for the risks. An example is set out below:

Probability Score x Impact Score = Probability-Impact (PI) Score

The PI can be used to rank the risk and establish a hierarchy for the risk within the project. The risks to the project can be managed in their order of importance to the project. The table below shows an example of how a typical ranking table can be set out. These tables can be easily set up in spreadsheet software such as Excel and the standard functions used to carry out the calculations and ranking.

Risk	Prob	Impact	P Score	I Score	PI Score	Rank
Risk A	Vlo	Med	1	3	3	5
Risk B	Vhi	Lo	5	2	10	3
Risk C	Med	Hi	3	4	12	2
Risk D	Lo	Med	2	3	6	4
Risk E	Med	Vhi	3	5	15	1

A secondary action of the assessment stage is to establish the Risk Owners. The risk owner is an individual within the project team whose responsibility it will be to develop an action plan to manage the risk (the Risk Management Plan). If the chosen method for the identification of risk is to use a workshop, this exercise can be carried out during the workshop.

Once all the risks have been identified, scored and the owners identified, all the information should be incorporated into a risk register for the project. An example project risk register has been included in appendix one of this guide. It is important to appreciate that while a risk may be 'owned' by an individual, it is the responsibility of all stakeholders to advise the owner when they believe the risk event is likely and work together on risk reduction.

4. Risk Handling

Risk handling outlines ways in which identified risks can be managed.. The initial approach will be to attempt to reduce the probability or impact of the risk. The three principal methods of achieving this are:

Risk Removal	Eliminate the source of the risk
Risk Reduction	Minimise the potential consequence of the risk. This may be achieved by carrying out further surveys, seeking alternative suppliers or adopting alternative methods of construction.
Risk Transfer	The Risk can be transferred to a third party who is better able to manage the risk. This can include, in some instances, the provision of insurance cover for the identified risks.

In implementing any of the above risk management strategies care should be taken that the cost of risk reduction does not exceed the expected value of the risk.

5. Risk Retention

If a risk cannot be fully managed, or the cost of implementing a mitigation method is uneconomical then an appropriate contingency sum should be provided for the risk.

A typical approach to risk retention is for the insurers to be given ownership of the risk along with a negotiated premium.

However under a collaborative agreement a number of innovative solutions can be applied, two examples of alternative risk retention are set out briefly below

Example One

In lieu of a series of contingency funds being set up by each of the participants to the contract, a project wide risk contingency is established. Each project participant contributes towards the management of the risks and where necessary is able to draw the costs of mitigation from the fund. At the completion of the project any residual fund is shared between the project participants.

Example Two

The transfer of risk could be viewed as consisting of the two components, the plan to mitigate and the costs associated with its implementation along with the financial burden, should the risk occur. If in transferring a risk, the financial penalties would leave the contractor financially insolvent, then the consequence of that risk would revert to the transferee who would also have to replace the insolvent contractor. In a case where the financial burden is so great and the management action required needs specialist knowledge, then the financial ownership can be retained or capped by the transferor and the transferee takes responsibility for only the management of the risk and can be rewarded for success and innovation in its management.

6. Risk Reporting

Once the initial risk review has been undertaken a report should be issued to all of the project stakeholders by the risk co-ordinator. The report should include:

- The current version of the Risk Register
- A summary of the principal project risks (based on the PI Scoring)
- A list of the stakeholders who participated in the study
- Details of the actions to be undertaken
- Timing of next formal review

In addition to the formal reporting that is described above, the principal project risks should be reviewed and reported against in the regular project progress meeting. It is recommended that a Risk Management Plan should be developed for each of these risks and updated by the risk owner. An example of a typical Risk Management plan has been included in Appendix two of this guide. The risk owner should work with other stakeholders whose actions may affect the identified risk. Very few risks can be adequately managed in isolation and the risk management plan should make it clear what actions will need to be carried out by others.

7. Risk Management Plan

Once the responses to the risks have been developed they should be formally recorded in a Risk Management Plan. This will enable the progress of the implementation and the effectiveness to be monitored.

The risk management plan sets out who does what, when an identified risk occurs. This makes it easier to respond rapidly to the risk and means that the actions taken are pre-planned and anticipated by the whole project team. Where action is needed by more than one party, everybody knows what is expected of them and who is responsible for which costs. This level of understanding ensures that the appropriate action is taken at the right time, so reducing the consequences of the risk occurrence.

A further benefit of having a separate plan for each risk is that the agreed response to a risk will often be transferable to other contracts with similar risks. Furthermore, if the risk management action could be improved the next time, this can be captured on the form and incorporated in the next risk management plan for that particular risk. Over time this will improve the response and further reduce the impact of each risk.

As the potential for a risk to occur passes, so the risk can be removed from the register, allowing the identified contingency to be released and if necessary allocated to new risks as they are identified and added to the register, each with an appropriate risk management plan.

Risk Management: The Good, the Bad and the Ugly

The fund manager for a large commercial project recognised that the project he had invested in was not progressing at it should. The project was being reported as 8 to 10 weeks behind programme and he had not seen any improvement in the situation. He asked for a brief review of the project to be undertaken by a construction consultancy organisation.

The consultant attended the next project meeting, which was also attended by the contractor and the project professional team. As part of the meeting, the contractor's monthly report was reviewed, including the contractor's project risk register.

The consultant noticed that the register consisted of only two risks, both of which related to planning issues and were assigned to the ownership of the developer.

The consultant expressed his surprise that a project, which was in 8 to 10 ten weeks delay and was continuing to slip, had only 2 only risks in the register. The contractor's project manager retorted "am I expected to list everything that might go wrong in the project risk register?"

The project was eventually delivered 15 weeks late and the contractor made a large penalty payment to the customer.

The project review that was undertaken by the consultancy organisation concluded that the principal reasons for the late delivery were poor communication by the contractor, lack of resources and late delivery of materials. These incidents were managed on a reactionary basis with no contingency planning having taken place.

The use of effective risk management on this project would have identified most of the incidents and enabled contingency plans or alternative procurement strategies to be developed, greatly reducing the project overruns.

Conclusions

Having read the preceding sections, you should now have some idea of how risks are identified, formalised and managed, but you will now be asking 'where do I start?'

Most people involved in construction know that things rarely go as planned and that often the outcome of a project is usually not as good as was hoped for in both the financial reward received and in technical quality achieved.

If you consider your next project using the guidance contained in this book, you will improve your chances of achieving your aims, because you will have discussed these in advance with the other stakeholders and you will all know what has to be done collaboratively to avoid the problems and failures. In addition, there is less risk of the adverse situations happening, because you and those working with you will have talked through what can go wrong and agreed whose job it is to control each potential situation as it arises.

As in the wider experience of life, 'a problem shared is a problem halved', and if you share it more widely, so the fraction that you have to deal with becomes smaller! While you may have been allocated ownership of a risk, it is in all the stakeholder's interests to assist you with the actions set out in the risk management plan should that risk occur.

The key to collaborative risk management is communication and trust. You must be open with those who are asking you to do the job about what can go wrong and you should ensure that you share this knowledge also with those who are working for and with you. In this way, everybody understands what is required of them and what they need to do to prevent problems arising. It is all common sense, but with a system applied to ensure that as little as possible is forgotten. There is also a further gain in that the next job will be able to benefit from what you have learned on this one, because you will have developed a response to a problem and recorded where it worked and how to do better next time.

And Finally

During the bombing campaign of Moscow during the Second World War an eminent Russian Statistician refused to go to the Air Raid Shelters on the basis that there were 7 million people in Moscow and therefore the chances of him being killed in an Air Raid were slim. However much to the surprise of his friends and colleagues one night he appeared in the Air Raid Shelter and they asked for an explanation. He explained that in Moscow there were 7 million people and 1 elephant and last night the elephant was killed in the Air Raid !!

Acknowledgements

Constructing Excellence (formerly Be) are extremely grateful to the members of the Collaborative Risk Management Working Group who have given a considerable amount of time to the development of this Guide.

In particular we would like to thank Sandy Mackay who chaired the project from its inception.

In addition we would like to thank Roy Evans from Gleeds who was always an enthusiastic supporter of the Guide and indeed prepared the original draft. Although it has been amended and added to – much of the original still remains.

Martin Howe and Peter Thompson did a considerable amount of editing to the final edition and we are grateful to them.

All the members of the Working Group helped to develop the concept in the early stages and provided valuable feedback along the way. This was a genuinely collaborative piece of work.

Many thanks to all concerned.

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Appendix Two
 Example Risk Management Plan

Risk Management Plan

Project		
Date of Workshop / Interview		
Risk Manager / Co-ordinator		
Name	Company	Contact No
Risk Description (as full a description as possible)		
Description of Risk impact		
Description of Response		
Details of Individual Risk		
Ownership		
Action Plan		
Who	When	What
Additional Comments		

Risk Management Useful Contacts

Organisation	Web Address
ARMIC – Association of Risk and Insurance Managers	www.airmic.com
IRM – Institute of Risk Management	www.theirm.org
RAMP – Risk Analysis and Project Management	www.ramprisk.com
APM – Association for Project Management	www.apm.org.uk
RICS – Royal Institution of Chartered Surveys	www.rics.org
C.E. – Constructing Excellence (Managing Risk)	www.constructingexcellence.org.uk/resourcecentre/default.jsp
<i>(**This calls up the CE Resource Centre. Then Click on "Managing risk" and then click "Related information" in the top right corner.)</i>	