BROADLEAF CAPITAL INTERNATIONAL PTY LTD

ACN 054 021 117

23 Bettowynd Road
Pymble
NSW 2073
Australia

www.Broadleaf.com.au

Tel: +61 2 9488 8477
Mobile: 015 433 184
Fax: + 61 2 9488 9685
Cooper@Broadleaf.com.au

Specialists in Strategic and Project Risk Management

RESOURCE PROJECT RISK MANAGEMENT

Outline of an Executive Development Programme, presented by Broadleaf Capital International in conjunction with the Centre for Mining and Energy, Sydney, 23-25 March 1998

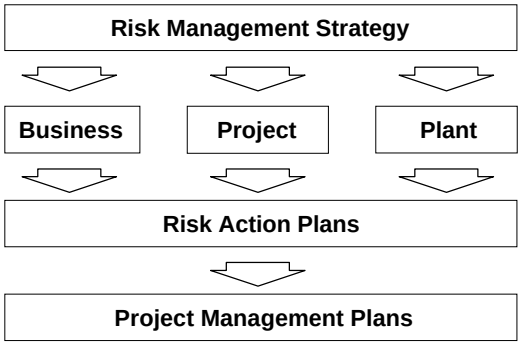
INTRODUCTION TO THE PROGRAMME

Risk management has many applications in the resources sector. It provides assistance with decisions at three levels. Some examples of the kinds of questions that risk management approaches can assist with are shown below.

- Strategic business decisions: are we in the right business, should we become involved in this project or development at all, will the development provide an adequate return on investment, is it possible to limit the downside, what is the best strategic option for this project?
- Project decisions: what are the most important risks confronting the project, is the project likely to meet its cost and schedule targets, what equipment choice provides the most appropriate balance between capital and operating costs including abnormals, how do we continually monitor and manage the risks?
- Plant or process decisions: what are the operating hazards of this process, what are the major environmental and safety issues be managed, how do we ensure that safety is built in at the minimum cost?

This course will focus on project decisions, but it will also discuss strategic and plant decisions, as there is always considerable overlap between these categories in practice. There will also be overlap with other processes such as value management. They must all be considered in the development of the risk management strategy and they all impact on the project management plan.

Different amounts of information are available at different stages of the development of a project, and the kinds of decisions that must be made require different levels of quantification and rigour. The course will cover qualitative and quantitative approaches to risk, to provide a comprehensive overview of risk management for resource projects.



Objectives

The objectives of this development programme are to:

- Provide participants with a broad appreciation of the benefits of risk management in resource projects;
- Introduce the main concepts of risk management and its implementation, including qualitative, quantitative and technical methods;
- Demonstrate the scope of application of risk management through case studies in the resource sector;
- Provide participants with sufficient understanding of the process to know when and how to undertake simple risk assessments in their work environment.

Benefits of Attending

At the end of this course, you will:

1. Appreciate the wide scope, benefits and application of risk management in the resource sector;
2. Be familiar with the steps in the risk management Standard AS/NZS 4360;
3. Understand the benefits and potential pitfalls of quantitative risk analysis techniques;
4. Be aware of the role of technical risk assessment approaches in resource projects;
5. Select appropriate approaches and timing to managing risk in your projects;
6. Be able to apply the Standard AS/NZS 4360 to simple risk assessments in your work environment;
7. Analyse risks for strategic and project decisions;
8. Enhance your project management by incorporating risk management and risk action plans.

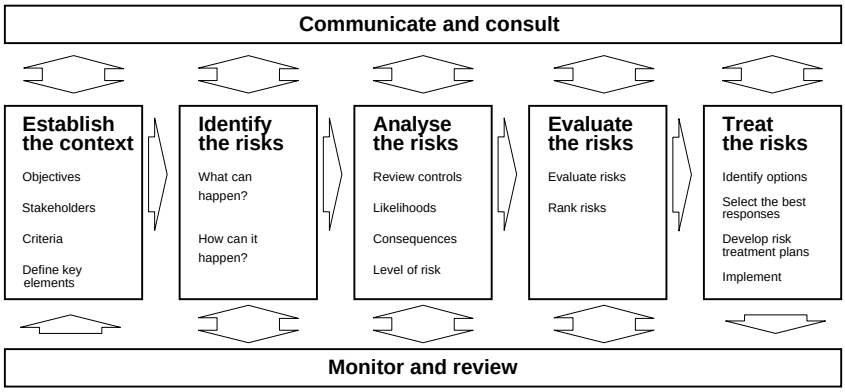
OUTLINE OF THE PROGRAMME

Day 1: Setting Risk Priorities with AS/NZS 4360

The first day of the course will be devoted to the Australian/New Zealand Standard on Risk Management, AS/NZS 4360:1995. This provides the basis for many forms of risk assessment in a wide range of applications, and is often the best method for an initial assessment of the risks in a project.

After a general introduction to risk management, the risk management process will be described in detail. The main stages in the process will be described, with case examples from recent projects. The description of each stage will be followed by group exercises to illustrate the main points in the context of an example project. The topics covered will include:

- Objectives, stakeholders and critical success measures, to provide the criteria against which the consequences of risks will be measured;
- Key elements for structuring the assessment;
- Risk identification processes, covering the merits and uses of brainstorming and checklist approaches;
- Risk analysis for determining the likelihoods and consequences of identified risks, with a focus on qualitative estimating approaches;
- Risk assessment approaches to setting priorities for risk actions;
- Developing risk treatment action plans for the major identified risks;
- Establishing risk monitoring and review processes in a project management team.



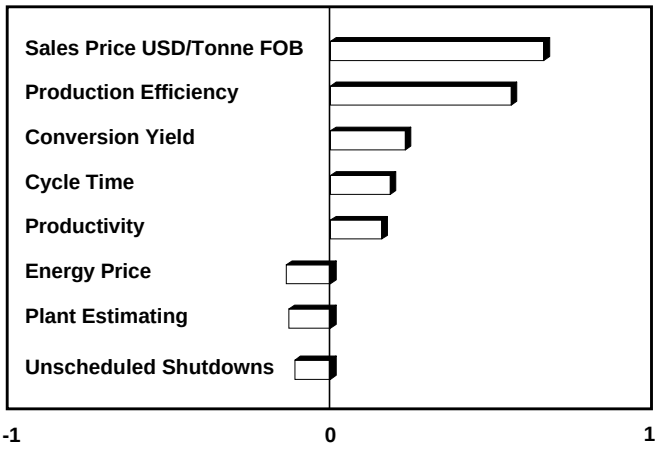
At the end of the day the participants will have a good understanding of the basic process with some experience of its practical application.

Day 2: Risk Quantification

Many projects require more than simply setting priorities. The second day will focus on extending the process to include detailed quantification of risk, with an emphasis on practical case studies from resource projects. The sessions will also address some of the pitfalls associated with quantitative risk modelling. Topics to be covered include:

- Simple quantification of uncertainty in a cost estimate. This session will use as a case study the cost audit of a large hydroelectric development.
- The use of risk simulation for cost and schedule estimation, covering the links between cost and schedule models and the circumstances when simulation is not appropriate.
- Financial risk models for capital evaluation. This session will draw on case study material from recent minerals processing plants and mine developments in Australia.
- Extensions of basic quantitative processes. This session will show how the basic approach can be extended to different applications. Two case studies will be used: the risk and reliability assessment of an LNG facility in the Canadian Arctic; and the selection of strategic options for crossing a major river with a large diameter pipeline.
- Obtaining information about uncertainty for quantitative models from engineers, estimators and technical specialists.

At the end of the day the participants will have developed their skills in quantitative analysis. They will have a good understanding of when and how it can be applied and its limitations.



Day 3: Technical & Environmental Risk Management

The third day will focus on extensions to the qualitative and quantitative processes discussed earlier in the course, and the implementation of risk management in an organisation. It will define the roles of some of the special tools and studies. Topics to be covered include:

- Technical risk assessment processes, including the kinds of risk studies appropriate at different stages of a project's development and the establishment of a technical risk programme.
- Technical risk assessment tools and techniques, including rapid ranking, fault trees, event trees, HAZOPs and other more detailed tools, with illustrations adapted from recent project experience..
- Assessment processes for environmental risks, showing how the basic process discussed on the first day is applied in substantially the same form to environmental assessment.
- Crisis management. A video and case study of BHP's response to the grounding of the Iron Baron on Hebe Reef off the Tasmanian coast will be used to demonstrate the value of advance planning and training for managing crises successfully.
- Organising for effective risk management and implementing the process, including the recommended steps for the introducing and adopting risk management as part of the organisational culture.

The day will conclude with a summary of the course and the practical lessons for implementing risk management in resource projects. Participants will leave with a good understanding of how, when, why and what risk management tools and processes to apply.

Contact:
Dr Dale F Cooper
Cooper@Broadleaf.com.au

Geoffrey Raymond
Raymond@Broadleaf.com.au

DETAILED TIMETABLE

DAY 1	DAY 2	DAY 3
Australian Standard AS 4360 Setting priorities and practical exercises	**Quantification processes and case studies**	**Extensions: technical and environmental risk assessment**
Session 1: Workshop introduction Session 2: Introduction to risk management Session 3: Risk management processes	Review of Day 1 Session 6: Risk analysis and cost estimation Discussion	Review of Day 2 Session 12: Technical risk assessment processes
BREAK		
Session 3: Risk management processes (continued) Exercise 4.1: Stakeholders and critical success measures Exercise 4.2: Key elements Discussion	Session 7: Financial risk models for capital evaluation Discussion	Session 13: Technical risk assessment tools and techniques Discussion on technical risk assessment
LUNCH		
Exercise 4.3: Risk identification, analysis and assessment	Session 8: Reliability analysis of an LNG facility Session 9: Eliciting probabilities for risk analysis Exercise 10: Quantification Discussion on quantification	Session 14: Introduction to assessment processes for environmental risks Session 15: Crisis management video and case study
BREAK		
Exercise 4.3: Risk identification, analysis and assessment (continued) Exercise 4.4: Risk treatment Session 5: Integrating risk and project management Discussion	Session 11: Guest speaker	Session 16: Organising for effective risk management Discussion on implementing the process Session 17: Summary and review of course activities Course appraisal