List of Figures

Chapter 1  Introduction

Figure 1.1  Overrun of actual costs of projects compared with cost estimated at time of appraisal 2

Figure 1.2  Overrun of project completion times 3

Chapter 2  Literature Survey

Figure 2.1  Risk Management life-cycle 19
Figure 2.2  Risk Management framework 20
Figure 2.3  A simple algorithm used for fault diagnosis 42
Figure 2.4  An example of a decision tree 45
Figure 2.5  Municipal Project Break-even - i vs. N 53
Figure 2.6  An example of a spider diagram 54
Figure 2.7  A five scenario illustration 58
Figure 2.8  A hypothetical de minimis level 62
Figure 2.9  Project duration probability 67

Chapter 3  Questionnaire on Risk Management

Figure 3.1  Questionnaire construction decisions 90
Figure 3.2  Framework of the questionnaire 93
Figure 3.3  The spread of the company’s reaction to the RMQ 98

Chapter 4  Analysis of the Questionnaire

Figure 4.1  Proportions of primary responsibilities for all the replies 101
Figure 4.2  A graph illustrating the percentage proportions of replies for the primary responsibilities between the two industries 102
Figure 4.3  Spread of ages of the entire sample 103
Figure 4.4  A 3-D bar chart to illustrate average no. of years in both industry and present company within each age class. 104
Figure 4.5 A measure of some safety facilities for the oil and construction industries, individually and together.  

Figure 4.6 Spread of answers for question 11 and 12.  

Figure 4.7 The averaged importance of certain characteristics for risk analysts, individually and when grouped.  

Figure 4.8 Percentages of replies representing companies being risk averse, neutral or seeking  

Figure 4.9 Methods used when responding to risk.  

Figure 4.10 A graph illustrating how often the two methods of risk transfer are used  

Figure 4.11 The average ‘rank’ values for the financial methods of transferring risk from the ‘overall’, construction and oil viewpoints  

Figure 4.12 An ‘overall’ averaged view on insurers’ extra provisions  

Figure 4.13 A 3-D line diagram to illustrate the spread of answers for the three risk sharing methods  

Figure 4.14 Summary of whether captives are the most manageable way of insuring risks  

Figure 4.15 (Summary of) The mean values of the influential initial incentives for developing a ‘captive’  

Figure 4.16 Summary of the problematic financial risks when insuring with a ‘captive’  

Figure 4.17 Percentages of the types of risks that are retained  

Figure 4.18 Mean values of the frequency for the methods used to finance retained risks  

Figure 4.19 A summary of the average competencies of the separate industries, individually and together (i.e. overall) to reduce risk  

Figure 4.20 A summary of the average competencies for the individual job categories in order to reduce risk  

Figure 4.21 A summary of the mean ranks allotted to the five risk reducing methods  

Figure 4.22 The spread of replies for the percentage of the total project cost
spent on the Management of the Project.

Figure 4.23 The overall cumulative frequency for Figure 4.22, i.e. replies for money spent on the Management of the Project

Figure 4.24 The spread of replies for the percentage of the total project cost spent on Risk Analysis.

Figure 4.25 The overall cumulative frequency for Figure 4.24, i.e. replies for money spent on Risk Analysis

Figure 4.26 Financial loss through unforeseen risks expressed as a percentage of the total project cost

Figure 4.27 A summary of the replies for the type of techniques used for risk analysis

Figure 4.28 Summary of how many respondents use risk analysis and at what stage of the project

Figure 4.29 A summary of the ‘overall’ replies, in percentages, of all six risks

Figure 4.30 A column diagram representing the distribution of ranked replies (in percentages) for the ‘TIME’ type of risk

Figure 4.31 A column diagram representing the distribution of ranked replies (in percentages) for the ‘ENVIRONMENTAL’ type of risk

Chapter 5 Risk Analysis Techniques used by AHL in comparison with other Oil Companies

Figure 5.1 A summary of the replies for the type of techniques used for risk analysis

Chapter 6 Case Study: AH001 Installation QRA

Figure 6.1 SMS framework pyramid

Figure 6.2 Field Location Map

Figure 6.3 Ivanhoe/ Rob Roy/ Hamish Field Development

Figure 6.4 Environmental data

Figure 6.5 Hazard Identification and analysis Process (Overview)

Figure 6.6 Hazard Identification and Analysis Process (Detailed)
Figure 6.7  The ALARP triangle for individual risk  

Figure 6.8  Group risk criteria  

Figure 6.9  Risk Management Flowchart  

Figure 6.10  A typical example of a current event tree used by AHL for hydrocarbon releases  

Figure 6.11  A real life worked example of an event tree used by AHL: Event I/21  

Chapter 7  Improvements to AHL Risk Analysis Process  

Figure 7.1  Event tree of I/21 with input values in the format for a Normal distribution, i.e. (mean : s.d)  

Figure 7.2  An exploded graphic representation of the new event tree input data (from Figure 7.1)  

Figure 7.3  An example of an Event Probability Profile (EPP)  

Figure 7.4  A graph illustrating the percentage change against the number of iterations  

Figure 7.5  Final event tree for I/21, complete with input and output distributions [format (mean : s.d)]  

Figure 7.6  Input distribution of the ‘initiating event’  

Figure 7.7  Input distribution of one of the ‘escalation nodes’  

Figure 7.8  Input distribution of ‘leak isolated and blowdown’  

Figure 7.9  Input distribution of one of the more common ‘total fatalities’  

Figure 7.10  An EPP illustrating the output results of the three fatality categories  

Figure 7.11  Output EPP of Total Fatalities  

Figure 7.12  A bar graph displaying ranges of total fatalities with their associated probabilities  

Figure 7.13  CEPP representation of Figure 7.11  

xvi