

## **Abstract**

The integration of risk management in major projects within the construction and oil and gas industries has never been more significant especially as these projects are becoming larger and more complex. The increased requirement for risk to be efficiently managed is also supported by the inflated amount of legislation in this area, mainly due to incidents like the Piper Alpha installation in 1988. Hence risk management is developing into a multifarious process which needs continual update throughout the project's life.

Even though the legislation has expanded, there is still no standardisation to which the firms are to perform risk management. Therefore, improvements to the techniques that are used are possible and necessary. Current methods are too conservative resulting in substantial costs and less understanding about the risks themselves. Therefore, more detailed risk management techniques are imperative.

This thesis determines the five steps of risk management which are essential to achieve a controlled risk environment. The research involves an in-depth questionnaire canvassing the largest companies within the construction and the oil and gas industries in the UK, who are constantly involved with major projects. The questionnaire ascertains important information which will assist companies in selecting the most pertinent and successful techniques for each of the five steps. A case study from the oil industry is introduced and proposals are made to improve the quantitative risk analysis methodology. This, in turn, will aid the decision making process when confronted with technical risks and will ultimately produce a more controlled risk environment. In addition, valuable information will be gained due to a better understanding of the risks as well as maximising profits.

A new risk analysis method is subsequently derived which is based on the use of the @RISK package. It is intended that the results of this thesis will be incorporated in future risk analyses.