

WTC'06 Open Session

abstracts

RISK MANAGEMENT ON TUNNEL PROJECT

Introduction

In the past 10 years or so there have been a number of well publicised tunnel construction failures. In the subsequent reporting on the reasons for the failures there appears in many cases to have been a lack of proactive management of the risks during the project. Proactive management means constantly assessing the risks to tunnel projects during the planning, design and construction phases and implementing prior plans for mitigation, reduction and removal of the risks before they occur. The publicity and consequential effects mean that the public, funders, regulators and insurers will have reduced confidence in our industry. This must be a matter of concern to ITA.

In recognition of these events ITA set up and has recently published guidance reports on managing risks during the planning, design and construction phases of a tunnelling project dealing with technical, safety and contractual matters. Working Groups 2, 3 and 5 have been proactive in this respect. You will hear from the speakers representing these 3 WGs and they will point out key issues and developments in dealing with Risk Management of Tunnel Projects.

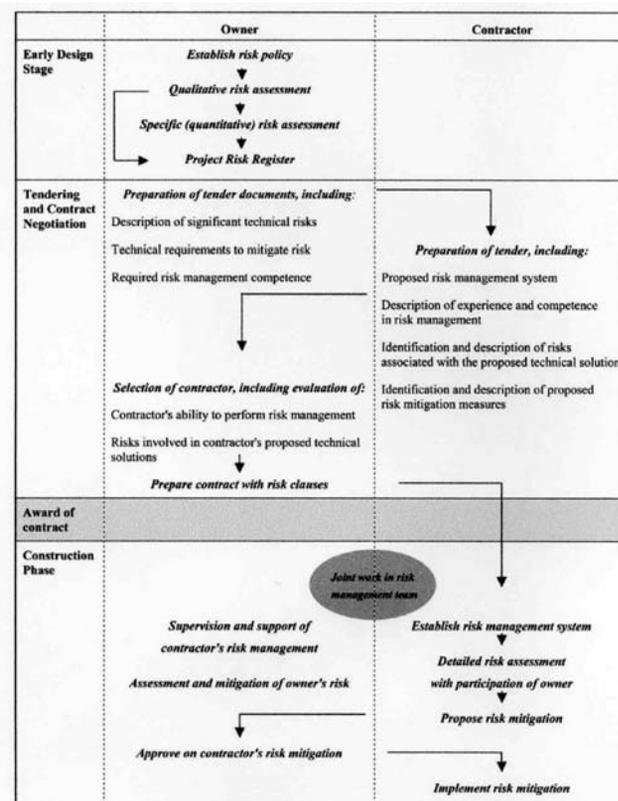
In parallel with the ITA initiatives the International Insurers (ITIG) have developed a new Code/Framework that seeks to facilitate and ensure the use of formal Risk Management techniques on tunnel projects. They seek to make it a condition that Insurances will only be given to a tunnel project providing that the Insurer is satisfied --through regular audits -- that Risk Management principles are being applied by all parties--client, designer and Contractor. The speaker from ITIG will explain the recent requirements. In addition the British Tunnelling Society recently co authored a Code of Practise that promotes the use of recognised Risk Management techniques for tunnel projects. The recent ITIG Code/Framework is based on that document which was published in 2003.

Finally we have a speaker who will provide a regional perspective of risk on tunnel projects.

The Open Session should be educative for those not aware of recent developments on the application of Risk Management in our industry and you are encouraged to ask questions and discuss your own experience .**Martin Knights - ITA Vice President**

ITA GUIDELINES FOR TUNNELLING RISK MANAGEMENT

The presentation will focus on the document prepared recently by Working Group 2, titled "Guidelines for Tunnelling Risk Management". It will provide the background for the preparation of the Guidelines and give an overview of the document and its main recommendations.



Traditionally, risks have been managed indirectly in tunnelling projects through the engineering decisions taken during the project development. Based on recent developments, it can be claimed that present risk management processes can be significantly improved by using systematic risk management techniques throughout the tunnel project. By using these techniques, potential problems can be clearly identified at an early stage of the project, so that appropriate risk mitigation measures can be implemented in a timely manner.

The presentation will describe the different steps of the risk management process, from the early planning phases of a tunnelling project until completion. The use and scope of a risk policy and a risk management strategy will be addressed.

It will be highlighted that the risk management strategy must include a definition of the risk management responsibilities of the various parties involved and a short description of the

activities to be carried out at different stages of the project in order to achieve the objectives, together with a definition of methods to be used for follow-up on results obtained through the risk management activities.

Some examples of risk matrices and the practical use of a risk register of some form will be presented.

The presentation will highlight that the use of risk management from the early stages of a project, where major decisions such as choice of alignment and selection of construction methods can be influenced, is essential. **Søren Degn Eskesen (Reporter) – Eric Leca (WG2 Animateur)**

MANAGING RISKS IN TUNNEL PROJECTS: ENSURING THE APPROPRIATE CONTRACTUAL APPORTIONMENT OF CONSTRUCTION RISKS.

The Contractual arrangements for underground construction projects should set out the obligations and liabilities for the prudent management of underground construction risks.

Understandably the substance of contracts are often driven by the interests of the financial aspects of projects – focussing upon income streams and resources allocation. The more fundamental harsh realities of construction risks are often only dealt with by comparatively unsophisticated means.

The systematic consideration of the many construction risk issues within the original project documentation directly impacts upon the management of construction risks, as well as minimising uncertainty with regards to their management during the construction phase.

Over the last 30 years members of the ITA WG 3 - Contractual Practices group developed a range of contractual propositions. Careful re-evaluation of these has revealed that they only related to a small proportion of the vast range of potential construction risk issues which should be dealt with in construction contracts.

A new framework has been developed which provides guidance on the substance of the many matters to be considered in contractual arrangements – and not to specify how the contracts should be drafted.

This new framework captures the broad range of subjects in which there are likely to be relationships between parties and highlights the need for consideration of their responsibilities, rights and obligations. The framework can be applied to the

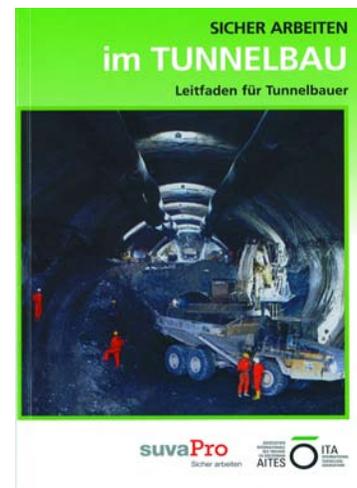
wide variety of different contractual practices that are employed world wide and is well suited to the many new forms of contracts emerging.

By using the framework parties to an underground construction project can better ensure that the most appropriate apportionment for construction risks are actually implemented - minimising conflict and ambiguity with respect to the management of construction risks - and thereby minimising the resultant risks in underground construction projects. **D. Arnold Dix - Animateur ITA WG3 – Contractual Practices / Martin Smith, Vice Animateur ITA WG3 – Contractual Practices**

OCCUPATIONAL HEALTH AND SAFETY RISK MANAGEMENT IN TUNNEL WORKS.

The paper provides an overview of occupational health and safety risk management set hopefully within the perspective of the wider international tunnelling community.

It briefly discusses hazard identification, sources of risk and risk assessment. Sources of guidance on the hazards of underground construction are given. The paper suggests that whilst underground construction can present risks to those constructing the works, some risks such as those arising from ground collapse may be greater to those on the surface above than to those in the tunnel.



It summarises recent research into third party risks with which the author has been involved.

The paper identifies the various parties to a tunneling contract and outlines their role or potential role in health and safety risk management. Although the phrase “health and safety is widely used, the paper recognises that occupational health is often neglected. Welfare is

another issue linked with occupational health and one which if addressed properly can make a contribution to health risk reduction.

Competence and training are essential parts of any risk reduction strategy and comment is made on this matter. **D. R. Lamont. Animateur ITA WG5 - Health and Safety in Works.**

THE CODE OF PRACTICE FOR RISK MANAGEMENT OF TUNNEL WORKS – FUTURE TUNNELLING INSURANCE FROM THE INSURERS' POINT OF VIEW

For many years now, engineering insurers have repeatedly had to cope with major losses in the tunnel construction sector. The question of the insurability of such projects has been on the agenda for quite some time. Munich Re and other insurers and reinsurers have therefore set themselves the task of getting together with representatives of the international tunnel construction industry in order to discuss and launch measures that are capable of promoting safety and hence loss prevention.



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As a result of the increasing number of major tunnel losses, (and following a similar successful initiative in the building industry) a working group was set up in London with the task of developing a code of practice for the risk management of tunnel construction projects. The working group comprised representatives of the UK construction industry and construction underwriters from the leading insurers and reinsurers of the London market. The original document prepared for the UK market was presented to the public in September 2003 and an international version has now been officially released by ITIG, the International Tunnel Insurance Group of which Munich Re is a leading member.

The purpose of this “Code of Practice for Risk Management of Tunnel Works” is to create a set of rules which is accepted by all the parties involved in the planning procurement and construction process and which addresses the systematic

identification, assessment, allocation, and handling of risks involved. It is proposed to make the application of the Code, which, in the form of an endorsement, shall become an integral part of construction insurance policies for tunnel projects, and contribute towards optimum risk management for all phases of tunnel projects.

This will be an important milestone in the improvement of safety standards of tunnel construction risks and thus contribute to them being made insurable on a profitable basis in the future. **Heiko Wannick. Construction Underwriter & Regional Risk Engineer Senior Consultant Tunnelling & Dam Construction - Munich Reinsurance Company**

KOREAN RISK MANAGEMENT PRACTICES : A CONTRACTOR'S PERSPECTIVE (SK E&C)

In Korea, the construction industry has changed radically since the past financial crisis in 1997; companies are faced with higher risks and uncertainties than ever before. Regulations and legislation on the environment, sustainability and safety on sites have placed more responsibility on organizations. Clients/Owners expect more, most importantly, they do not want surprises, and are more likely to engage in litigation when things go wrong. For construction industry, it is most important to secure more profitable project in bid phase and to minimize the risk under the construction stage since project profit is fully determined at the stage of contracts and negotiation. The key strategy for construction industry, the ‘Order Amount’ determines Profit at contract and negotiation, and ‘Risk Management’ through long term can increase revenue at project execution. Hence, the success of project management in construction industry depends on precise prediction of risks and risk hedge planning, and prompt response to contingency plan throughout the marketing and project execution phase.

This paper describes one of Korean risk management systems developed by SK E&C, as a contractor’s perspective. This system provides a complete integration of project life cycle for marketing and operating functions to make winning profitable projects by minimizing operation risk systematically. **Woong-Suk Yoo1 - Vice-President, SK Engineering & Construction Co., Seoul, Korea**