



Health and Safety in Tunnel Construction New Delhi 20 – 21 February 2012 India Habitat Centre

Lectures will be delivered by Donald Lamont (Director Hyperbaric & Tunnel Safety Ltd, UK) & Martin Vogel (SUVA, Swiss Accident Insurance Fund).

Synopsis of lectures - Monday 20th February

Session 1 – General Overview

1. **Welcome and Opening**
2. **Introduction to Health & Safety from WG5 including video:** The lecture will give a general overview of the health & safety hazards of tunnelling.
3. **Legislation relevant to host nation, Guidance**
4. **Hazard identification, risk assessment and risk management:** The lecture covers the main hazards, methods of risk classification and the approach to risk management.
5. **Role of parties to contract, contract requirement for Health & Safety, Health & Safety competence of contractor:** The lecture will describe the role of parties involved, the main H&S elements in the contract and the role of the contractors' competence.

Session 2 – Hazards and Risks associated with different construction methods

6. **Machine tunnelling in soft ground and hard rock:** The lecture will describe the main safety problems associated with the use of soft ground and hard rock TBMs.
7. **Drill & blast explosives safety:** The lecture will give a comparison of D&B and TBM, will cover the hazards including a typical accident and will highlight explosive safety.
8. **Sprayed Concrete Lined Tunnelling:** The lecture will cover the main hazards associated with SCL tunnelling and will discuss elements of the safety management.
9. **Hand tunnelling, Shaft sinking, Ground Improvement, Compressed Air, Membranes, Tunnel Services:** The lecture will briefly cover each of the topics listed and the main H&S hazards associated with them.



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Session 3 – Safety in Tunnelling Construction

10. **Fire:** The lecture will look at the characteristics of fire and what is necessary for a fire to occur – oxygen, ignition and fuel – and how these essentials can be controlled in a tunnel. It will go on to examine fire detection and extinguishing strategies for use in tunnels.
11. **Tunnel transport and Access:** The lecture covers the hazards involved with different transport methods and will highlight the various access methods including deep shafts and cableways.
12. **Emergency procedures, Communications, Lighting:** The lecture will discuss the foreseeable emergency scenarios which can occur in tunnels before going on to examine the requirements for emergency planning and responding to emergencies. Various utility services in tunnels will be discussed along with their role in the response to emergency situations.
13. **Ventilation:** The lecture covers the role of ventilation, the main pollutants and gives support to the layout of ventilation systems.

Session 4 – Health in tunnel construction

14. **Occupational Health - Welfare:** The lecture will identify and describe the two principal roles for occupational health in tunnelling - fitness for work and ill health due to work - and then explore in more detail the occupational health hazards of tunnelling. This will be a double session and will go on to discuss the provision of welfare facilities in tunnels.
15. **First Aid and Rescue:** The lecture covers first aid and gives advice to the organization of internal and external rescue in the tunnelling project.
16. **Competence of work force (training):** The lecture describes the main requirements to the competence of the work force including formation and training.
17. **Personal Safety, Atmosphere monitoring, Self-rescuers:** The lecture will discuss personal safety including PPE before focusing on the occurrence and detection of the various hazardous atmospheric contaminants which occur in tunnelling – gases, fumes, dust and heat. The lecture will conclude with a discussion on the selection and use of self-rescuers.