



Training session WTC2016
'MONITORING & CONTROL in TUNNELLING'
22nd – 23rd April 2016
Venue: Moscone Center – Marriot Marquis
San Francisco - USA

Objective: This training provides the purpose, methods, and examples of “monitoring” the effects of tunnelling, including the monitoring of tunnel machine performance, to control tunnelling to achieve acceptable excavation performance with stable underground structures, and prevent damage to existing structures and utilities. Due to the great variability in ground conditions, monitoring has an essential role in tunnelling regardless of method of excavation. It is the only effective means to allow the tunnel design and construction procedures to be adjusted and validated as tunnelling takes place. Topics include instrumentation (equipment and typical applications), interpretation of monitoring data, role of monitoring in risk management, contractual aspects, and case histories. The course is of interest for owners, designers and construction engineers, supervisors, and managers.

Friday, 22nd April 2016

Session 1: Introduction and Overview

- 09.00 – 09.30: Welcome and Opening: ITA and local representatives – S. Eskesen & W. Hansmire
- 09.30 – 10.00: General presentation on tunnel monitoring (objectives, why, what and who) – E. Cording
- 10.00 – 10.30: Types of instruments, data collection, information management – K. Rabensteiner
- 10.30 – 11.00: Coffee Break
- 11.00 – 11.45: Instrumentation installation – F. Amberg
- 11.45 – 12.30: Topographical methods to monitor deformations - GPS, LiDAR, InSAR – L. Gallison
- 12.30 – 14.00: Lunch

Session 2: Methods and Interpretation

- 14.00 – 14.30: Monitoring methods and layout in conventional tunnelling - A. Marr
- 14.30 – 15.00: Monitoring methods and layout in mechanized tunnelling – J. Yan
- 15.00 – 15.30: Control of Settlement in TBM Tunnels – A. Maxwell
- 15.30 – 16.00: Coffee Break
- 16.00 – 16.45: Design criteria of monitoring and relationship to tunnel design and construction (part 1) – P. Grasso
- 16.45 – 17.30: Design criteria of monitoring and relationship to tunnel design and construction (part 2) – V. Gall
- 17.30 – 18.00: Questions and Answers

Saturday, 23rd April 2016

Session 3: Contractual Aspects, Roles and Responsibilities

- 09.00 – 09.45: Contractual roles and responsibilities: what entity has responsibility? – E. Grøvd
- 09.45 – 10.30: Transferring monitored data into information for the contract management – R. Galler
- 10.30 – 11.00: Coffee Break
- 11.00 – 11.45: Control of Tunnelling Works using In Tunnel Data (from WG2 Report) – C. Yoo



11:45 – 12:30: Hazards warning level and countermeasures in tunnelling – T. Celestino

12.30 – 14.00: Lunch

Session 4: Monitoring interferences, risk management, and case histories

14.00 – 14.30: Role of monitoring on risk management – A. Assis

14.30 – 15:00: Monitoring Interpretation – Case Studies – G. Jedlitschka (GEOCONSULT)

15:00 – 15:15: Case Study: Interferences with excavation works – ATLAS COPCO (TBC)

15.15 – 15.30: Modern Monitoring on Machines for Conventional Tunnelling – T. Melbye & M. Hauki
(Co-author - NORMET)

15.30 – 16.00: Coffee Break

16.00 – 16:20: Modern Monitoring on Drilling Jumbos – A. Laitinen (SANDVIK)

16.20 – 16.40: Monitoring for Soft rock TBMs – K. Böppler (HERRENKNECHT)

16.40 – 17.00: Monitoring on Hard Rock TBMs – ROBBINS

17:00 – 17:30: Discussion, Summary and Closing of the Seminar