



ASSOCIATION
INTERNATIONALE DES TUNNELS
ET DE L'ESPACE SOUTERRAIN

AITES

ITA

INTERNATIONAL TUNNELLING
AND UNDERGROUND SPACE
ASSOCIATION

ITA BIM WORKSHOP

The International Tunnelling and Underground Space Association
Building Information Modelling in Tunnels Workshop

Monday, 25th April 2016 – 14:00-17:30
WTC2016 San Francisco, Moscone Center



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ITA BIM WORKSHOP – Monday 25th April 2016 – SCHEDULE

- 2:00PM Welcome
- 2:15PM Introduction: What BIM is all about? – **Dr Jurij Karlovšek**
- 2:30PM Part 1: Pre-contracts, Cost Estimation and Delivery Management with BIM including NATM Excavation & Support, Resource and Programme Management – **Mr Scott Keniston**
- 3:15PM Part 2: Lining and Equipment models for Design, Construction and Asset Management Secondary/Inner – **Dr Marko Žibert and Mr Martin Lah**
- 4:00PM Break
- 4:15PM Project Case Study 1: Contractor Experience – application of 5D BIM for a major underground project tender – **Mr Neil Tyson**
- 4:45PM Project Case Study 2: Support to Contractor – BIM information content management for major underground project – **Dr Gabriele Eccher**
- 5.15PM Feedback Session: Set up of the Working Group 22, Tasks and Aims – **Dr Jurij Karlovšek**
- 5:30PM Close



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2:00PM Welcome – Dr Jurij Karlovšek

Key Elements

Role of the ITA – assess and provide guidance on the process

Audience Experience: Real time survey and comparison with the rest of the world, Developed nations experience

Workshop objectives: Are the current plans for BIM ('TIM') appropriate or do we need something more – Introduction of *Working Group 22 - Information Modelling in Tunnelling*



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2:15PM Introduction: What BIM is all about? – Dr Jurij Karlovšek

Key Elements

Broad Overview: Building Information Modelling (BIM) – Introduction and definitions

Summary and State of Play: Level One, Level Two and Current focus

Worldwide Approaches worldwide: Who is doing what?

How is tunnelling different in a BIM sense?

What are the current trends?



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2:30PM Part 1: Pre-contracts, Cost Estimation and Delivery Management with BIM including NATM Excavation & Support, Resource and Programme Management – Mr Scott Keniston

Key Elements

1. Introduction – Tunnel Cost Estimation and Programming
2. Real Applications – Pre-contracts, Feasibility to Front End Engineering and Design (FEED)
 - Context - A snapshot of “the old way”, to determine quantities/programme for a major NATM road tunnel project.
 - Context “State of the Art” – A snapshot of 5DBIM with a major project example – NATM with many road headers and sequential top heading excavation.
3. 5DBIM Application during Project Execution – Decision Support Systems with 5DBIM
 - Clear and quantified demonstration for D&C teams of where the value in this technique is, and how this can transform a project from the Junior Engineer to the Project Director
 - Additional project possibilities for Client Team applications, Delivery Management



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3:30PM Part 2: Lining and Equipment models for Design, Construction and Asset Management Secondary/Inner – Dr Marko Žibert and Mr Martin Lah

Key Elements

1. Modeling principles targeting design optimization
 - Concepting with generic modeling
 - Detailing with discipline specific modeling
 - Collaboration of diverse disciplines
2. BIM Management and Collaboration of diverse disciplines
 - Project goals and BIM uses
 - BIM process design and Information exchanges
 - Collaboration procedures
 - Quality control
 - Roles & Responsibilities
3. Publishing & Sharing
 - BIM servers
 - Common Data Environment
4. Asset management
 - Client's requirements and possibilities
 - Utilizing existing databases



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4:00PM Break – 15mins



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4:15PM Project Case Study 1: Contractor Experience – application of 5D BIM for a major underground project tender – Mr Neil Tyson

Key Elements

1. Project Outline – 5DBIM used in hard dollar tender for major underground project
2. Tender Requirements
3. BIM – Contractor Process – Experience
 - CAD/GIS and Physical Information (inc. Geology/Weather and Specification)
 - Cycle time build up
 - Plant Rules / Fleet and Spatial Rules
 - Construction Programme and Quantities Output
 - Schedule of Rates and Estimate
4. Bid Review and Approval Process
5. Probabilistic Programming – Monte Carlo work
6. Quantity Checks
7. Post Tender – Client Engagement, change management and improved communication
8. Conclusions & Lessons Learned



ITA BIM WORKSHOP – Monday 25th April 2016 – SCHEDULE

4:45PM Project Case Study 2: Support to Contractor – BIM information content management for major underground project – Dr Gabriele Eccher

Key Elements

1. Project 1 – 5D BIM used for a major deep tunnel project
 - i. Project Requirements
 - ii. BIM Process
 - CAD and Physical Information (inc. Geology and Specification)
 - Construction Programme and Quantities Output
 - Material flow and stocking areas planning
 - iii. Probabilistic Analysis – Monte Carlo for assessing TBM performances
 - iv. Quantity Checks
2. Project 2 – BIM as information modeller for a major urban tunnel
 - i. Project Requirements
 - ii. BIM Process
 - CAD/GIS/PDF and Physical Information (inc. Geology, Building Info and Specs.)
 - iii. Digital Project – Deterministic/Statistic Building Risk Assessment and EPB pressure optimization
3. Conclusions & Lessons Learned



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5.15PM Feedback Session: Set up of the Working Group 22, Tasks and Aims – Dr Jurij Karlovšek

Key Elements

BIM or NOT BIM in tunnelling - if YES it means:

Introduction of ***Working Group 22 - Information Modelling in Tunnelling***

1. Develop common procedures based on experiences
2. Identify where tunnelling differs fundamentally from civil surface construction and ensure BIM standards and processes reflect these major differences.
3. Develop a document and procedures for consultants, contractors, owners, and operators
4. Establish workshops to help define, consult and promote adoption of the document and associated procedures
5. Consult local authorities to ensure a common procedures are developed
6. Provide contact points for each part of the BIM process, and list suppliers developing different BIM software, to ensure a flexible and harmonised approach to the service



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5.30PM Close - Dr Jurij Karlovšek

Key Elements

Vote of thanks

Contact

Future events