

## WORKING GROUP 2 - Research

- **2 meetings**
  - 7 Nations present: Czech Republic, Denmark France, Korea Spain, USA
- **Agenda**
  - Review of on-going activities
  - Discussion on future works
- **On-going activities**
  - Site investigation
  - Monitoring and Control during Tunnelling
  - Risk management

## WORKING GROUP 2 - Research

### ▪ Status of recommendation preparation

- Recommendation on Monitoring and Control: final draft expected to be presented at the Budapest meeting
- Recommendation on Strategy for site investigations of tunneling projects a revised draft of the document scheduled to be reviewed at the Budapest meeting

### ▪ Works on Risk management

- consolidated training document has been prepared
- preparation of a new reference manual
- first draft of the document expected to be prepared by the end of 2009



## WORKING GROUP 2 - Research

### ▪ New topics considered for future activities

- Impact of depth on the approach to tunnel design and construction
  - ✓ may be conducted concurrently with joint ITA-ISRM initiatives on site investigations for rock tunnels
- Impact of life cycle cost considerations and sustainable development on tunnel design
- Tunnel projects for geothermal applications



# Contractual Practices WG3

Animateur: Arnold Dix

- Publication on ITIG codes consistency with ITAs  
25 contractual propositions approved for  
Executive publication
- Framework for objective review of any  
construction contract drafted. Supportive script  
commenced – completion by Budapest  
scheduled.
- Collaboration with WG 19 conventional  
tunnelling agreed in principle

## WORKING GROUP 5 Health & Safety in Works

### ▪ 2 meetings

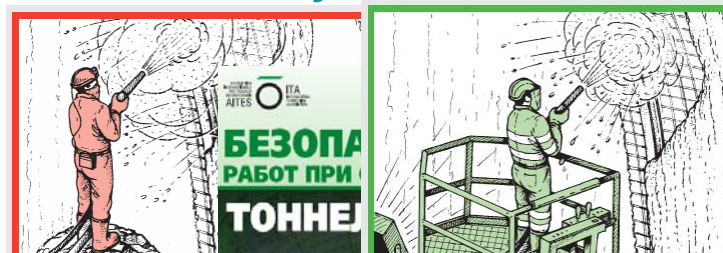
- 13 Nations present: Brazil, Germany, India, Norway, Portugal, Russia, Switzerland, Singapore, Spain, Sweden, Thailand, UK, USA — a lively and productive meeting

### ▪ On-going activities

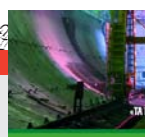
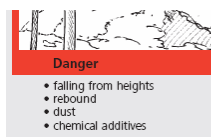
- Revision of "Safe Working in Tunnelling" booklet
- Publication of "Guidelines for good occupational health and safety practice in tunnelling" as an ITA Report.
- Guidance on "The safe use of flexible ducting in tunnel construction"



## WORKING GROUP 5 Health & Safety in Works



- Safe Working in tunnelling booklet
- Published in 9 languages
- Needs updating to reflect state of art



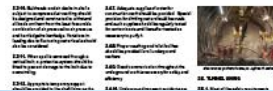
## WORKING GROUP 5


### Health & Safety in Works

#### ▪ Guidelines on Occ Health and Safety

- Text based document
- To be published as an ITA Report

**Guidance on safe use of flexible ducts**  
In preparation






ITA/AITES

**ITA/AITES**

**Working Group Report**  
**Maintenance and repair of Underground Structures**  
**Agra India**  
**ANIMATEUR**  
**Henry A. Russell**  
**VICE ANIMATEUR**  
**Rene Van Der Bosch**

23 September 2008

1/03



ITA/AITES

**MEMBER NATIONS** 8

**Nation Names**  
Denmark, Finland, Germany, Norway, Switzerland, Thailand, United States of America

**Key Items Discussed**  
The progress of our new document *Guidelines for Structural Fire resistance for Metro Systems*  
To be Submitted to General Assembly in Bucharest in 2009.  
Presentations were made by members form Germany , Finland USA

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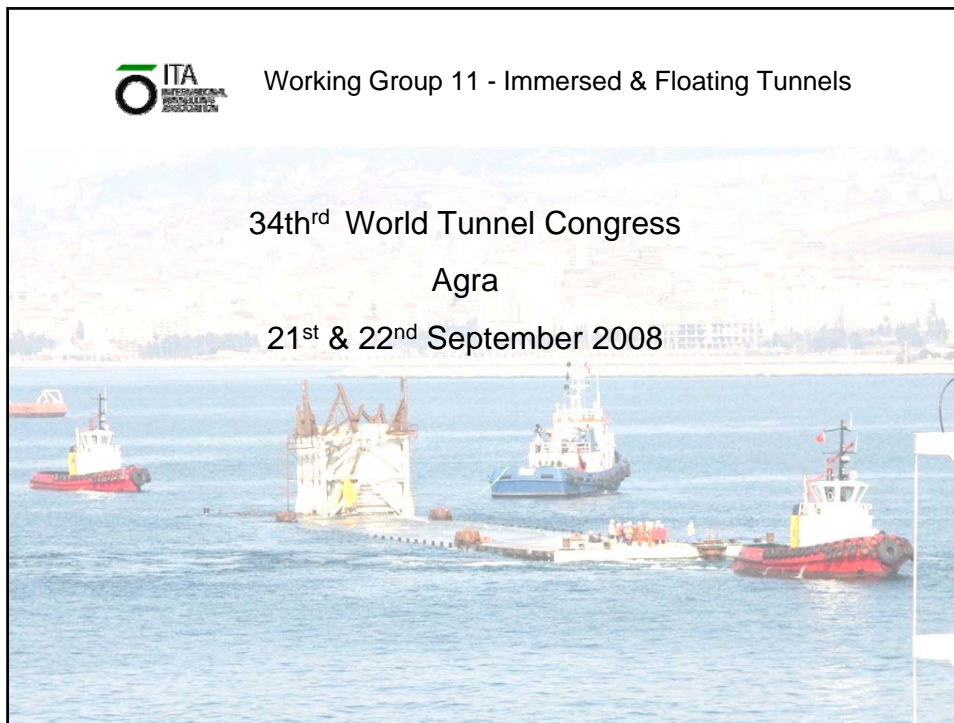



ITA/AITES

**KEY Issues Continued:**

The Working Group is pleased to announce that the National Fire Protection Association, in their document, *NFPA 502, Standard for Road Tunnels, Bridges, and other limited Access Highways, 2008 Edition* has adopted our Guidelines and recommendations for structural fire protection for tunnel structures. This is a significant acknowledgement of the work performed by the Association and in particular of the member nations who participated in the development of the Guidelines.

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Working Group 11 - Immersed & Floating Tunnels

## Agenda

- Opening and introduction
- Amendments to agenda
- Approval of minutes
- Report on last year's activities
  - Catalogue of immersed tunnels
  - Owner's Guide
  - Glossary of Terms
  - New members
- Work plan for coming year
- Communications and web site
  - ftp site
  - email
  - web site material
- Country reports & project presentations
  - Marmaray project, Istanbul
  - Limerick Tunnel, Ireland
  - Bjørvika Tunnel, Oslo
  - Busan Tunnel, South Korea
  - Others
- Floating Tunnels
- Technical presentations
- AOB
- Close

- Report on Past Year
  - Catalogue
  - Owner's Guide
- Presentations
  - Limerick
  - Bjørvika
  - Bosphorus
  - Busan-Geoje
- Discussions
- Work for This Year

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# Catalogue

- 29 New Tunnel Sheets in Preparation
  - 14 are in draft form awaiting review
  - 9 being drafted
  - Several on hold (too early)
- Utility Tunnels
  - Existing catalogue to be broken out and uploaded



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# Owner's Guide

- 8 Sections Drafted Awaiting Review
- 11 Technical Sections still to be Drafted
- Introductory Section will be Added
- Glossary of Terms to be updated
- Special Working Paper on Dredging Issues will be prepared



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## ITA WG12 Shotcrete Use

### Regular meeting, Agra Sep. 21 2008

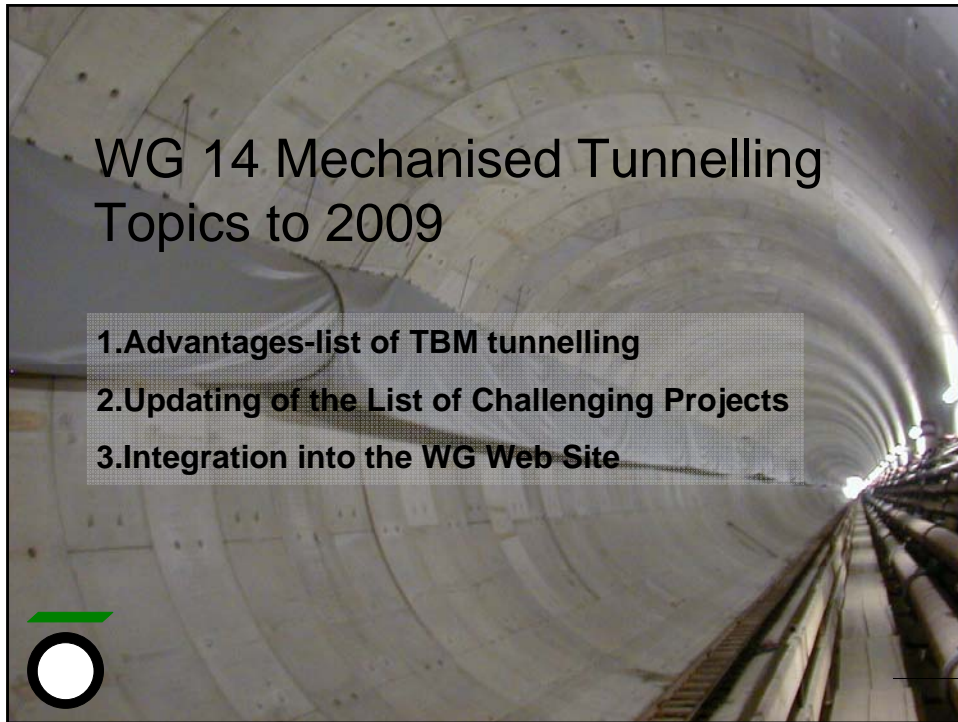
- State of the Art Report – illustrated version
- Evaluation of fiber reinforced sprayed concrete
- Sprayable mortars for fire protection
- Nozzleman certification
- Sprayed concrete curing and durability
- Training: interaction with WG18
- Glossary
- Issues from the ExCo – Animateur meeting
- Recent and future events

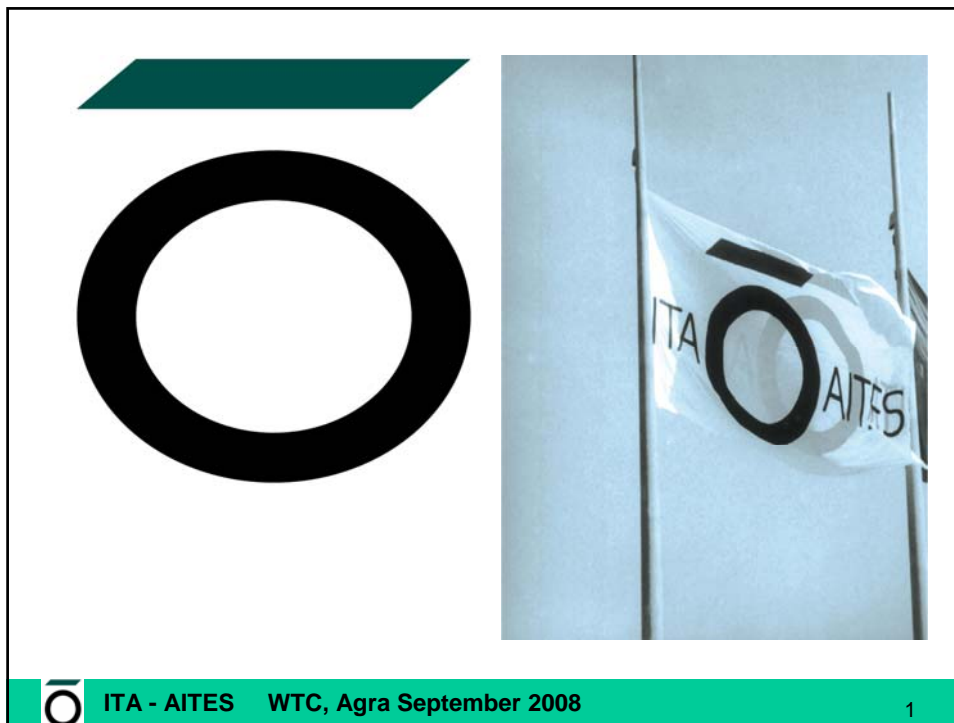
## Evaluation of Fiber-Reinforced Sprayed Concrete

- Green light from ExCo to proceed with tests
- Report with interim results to be released soon
- Guidelines about new test program prepared; final test specifications to be prepared after meeting with prospective suppliers; new call for tests
- 2-purpose tests: short term and long term for temporary and permanent support

## Sprayed Concrete Curing and Durability

- Practice varies enormously in different countries
- Serious consequences (safety and durability) of bad practices mostly for permanent concrete
- Different procedures (internal and external curing) discussed
- Evaluation tests not well accepted all over the world
- WG report to be prepared soon





## WORKING GROUP 15 - UNDERGROUND WORKS AND THE ENVIRONMENT

- 2 meetings, 7 Nations present:
  - Italy
  - Japan
  - Korea
  - Norway
  - Singapore
  - Thailand
  - USA

## ITA WTC AGRA 2008 AGENDA WG 15

1. Report on Environmental and Sustainable reasons for going Underground
2. Presentations by those attending the meeting
3. Topics on Underground Constructions and the Environment
4. Future works of the Working Group



## ENVIRONMENTAL AND SOCIAL IMPACT

- Advantages and opportunities by going underground
- Challenges by going underground
- Recommendations and Guidelines when going underground



## 9th Meeting of Working Group 17 Long tunnels at great depth


- 7 members from 6 different countries: Canada, India, Italy, Korea, Norway, and Switzerland
- All former members
- Final lecture of updated WG 17 report
  - Very efficient meeting, high technical interest
- 2 new chapters have been added to the first version:
  - Special conditions for hydraulic tunnels;
  - Special conditions for subsea tunnels.



## 9th Meeting of Working Group 17 Long tunnels at great depth

- Goal of the working group => successfully reached
- Approbation of final document
- Updated report will be submit to the ITA board
- Some pictures will be added
- next meeting in Budapest :  
focus on case histories





**General Assembly**  
**Report of Working Group 19**  
**“Conventional Tunnelling”**

Heinz Ehrbar  
 Animator WG 19

ITA - AITES WTC 2008, Agra, India General Assembly WG 19
1

### Excavation Class Matrix, Rock Tunnel, 2 lane, D&B

Erste Ordnungszahl	Abschlagslänge bis	Zweite Ordnungszahl															
	Kalotte	Stützmittelzahl															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
1	keine Vorgabe																
2	4,0m																
3	3,0m <small>0,90 - 1,80 1,20 - 2,10</small>																
4	2,2m <small>0,80 - 2,00 1,96 - 3,16</small>																
5	1,7m <small>1,21 - 2,81 2,16 - 4,36</small>																
6	1,3m <small>2,54 - 4,54 3,89 - 5,89 5,56 - 7,56</small>																
7	1,0m <small>4,36 - 6,94 6,41 - 9,01 8,74 - 11,34</small>																
8	0,8m																
9	0,6m																

If two Matrixareas overlap the boarder between this areas is the mean value of this, between an upper and lower boundary, overlapping-area

ITA - AITES WTC 2008, Agra, India General Assembly WG 19
2



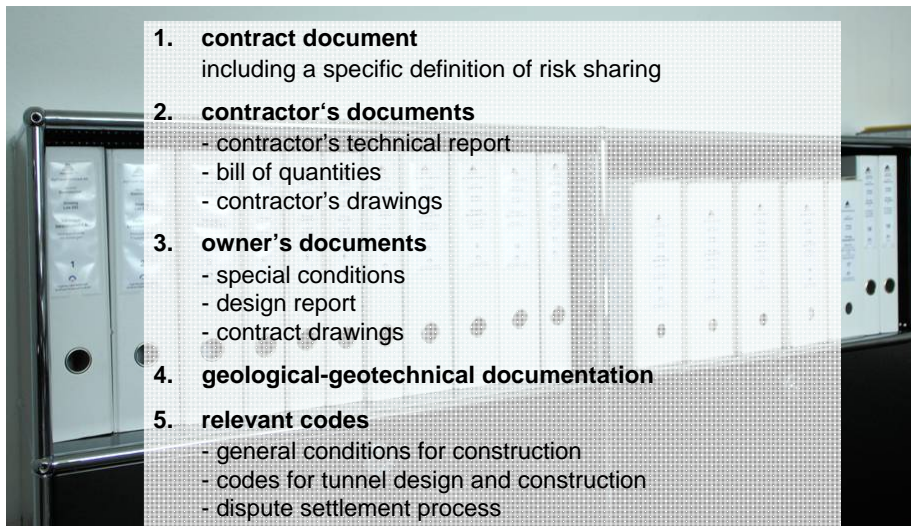
### Characteristics



- Hard rock tunneling
- Drill and blast
- Rock is a building material



### Contract documents



1. **contract document**  
including a specific definition of risk sharing
2. **contractor's documents**
  - contractor's technical report
  - bill of quantities
  - contractor's drawings
3. **owner's documents**
  - special conditions
  - design report
  - contract drawings
4. **geological-geotechnical documentation**
5. **relevant codes**
  - general conditions for construction
  - codes for tunnel design and construction
  - dispute settlement process



## ITA General Assembly 2009, Agra Activity Report of Working Group 20 Urban Problems - Underground Solutions



before

### Objectives:

- Report on subsurface use to solve urban problems
- Directed at planners and decision makers to provide creative and efficient ideas
- Focus is less on technical details but more on solutions to urban problems, may they be social, economic, environmental or aesthetic



after \_\_\_\_\_



**WG 20 - Urban Problems - Underground Solutions**

## Report and Case Studies

### Contents of report

- Introduction
- Typical urban problems
- Typical underground solutions
- Decision making process
- Summary
- Annex: Case studies of projects

### Status of report:

- 2nd full draft, (41 pages)
- WG reviewed contents
- final draft due for Budapest

### Representative Case Studies

- Subway/Rail: [Amsterdam](#)
- Road: [Prague Ring Road](#)
- Parking: [Sydney Opera](#)
- Energy: [Climespace](#)
- Cultural: [Smithsonian](#)
- Utilities: [Cable tunnels](#)
- Transport: [Waste collection NL](#)
- Multiuse: [SMART](#)
- Storm water relief: [Thun, CH](#)

- total of approx. 25 international projects



**WG 20 - Urban Problems - Underground Solutions**

## Changes in animateurs team

### Changes in animateurs team

- Animateur: Amanda Elioff, USA
  - Vice-animateur: Wout Broere, NL
  - Vice-animateur (ACUUS): Junji Nishi, Japan
  - Tutor: Harvey Parker, USA
- 
- 14 participants from 9 countries
- 
- Coordinated with ITA-CUS and WG15



Lane Cove  
Australia



***WG 20 - Urban Problems - Underground Solutions***