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1. Message from the Chairman

Dear members of ITA COSUF,

The last months have been quite an active period of ITA COSUF as you may easily see when going through this newsletter. What pleases me enormously is the fact that we have been able to initiate new activities within ITA COSUF beside the second internal annual workshop which normally takes place in the autumn.

With the support from the European Commission, ITA COSUF has organised for the first time the Road Tunnel Safety Forum. This is an initiative that focuses exactly on day-to-day issues of operational safety of road tunnels. The initiative was quite well received and we intend to continue with this forum in the coming years.

For the first time the ITA COSUF Award has been handed over to a young researcher, Ben Niemen from the Netherlands, for his outstanding contribution to the operational safety of underground facilities. Through that award we hope to steer the interests among young engineers and researchers to become active in the field of safety and to motivate them to strive for excellence. Besides, these new activities also the annual workshop was an event of high quality and I would to thank all presenters for their presentations.

As you may have noticed, with this newsletter we also introduced a little different shape of the lay-out and content. New is the possibility for COSUF members to introduce themselves in one page from the perspective of operational safety. Ben van den Horn, the Coordinator Activity Group 1 has elaborated a first sample on the last page, with the purpose to stimulate other COSUF members for the issues to come in 2010. If you are interested to highlight your company in the Newsletter please let us now. Besides, we will make effort to distribute this newsletter in other relevant networks with the purpose to interest more parties in the COSUF activities, for instance the Road Safety Officers network, PIARC, UITP, etc.

So, with this re-shape and brush-up of the newsletter, we hope to provide more information in a more attractive way about the activities of ITA COSUF.

We are pleased very much by the outcome and hope that it will find your interest too.

Felix Amberg

2. Road Tunnel Safety Forum, 4 – 5 November 2009, Lyon.

This was the first European Forum of Road Tunnel Safety Officers since the European Directive 2004/54/EC was introduced. This event was co-organized by CETU, ITA COSUF, PIARC and the European Commission.



Forty five Safety Officers from 18 EU member states participated to exchange information, evaluate first operational experiences and compare role and duty interpretation of the Safety Officer. It appeared amongst others that independence of the Safety Officer is needed in order to improve safety in road tunnels. Fundamental issues that were discussed were co-ordination with emergency services, verification of training and maintenance, significant incidents, legal aspects and safety documentation updates.

At the end of the forum it was concluded that further work is needed. There was a lack of time to discuss all relevant questions, and questions were identified that need new guidelines to answer. The European Commission is ready to support to draft EU guidelines for Safety Officers to further implement the European Directive 2004/54/EC in cooperation with PIARC and ITA COSUF.

3. ITA-COSUF Internal Workshop on Safety Challenges, 5 November 2009, Lyon.

After a joint lunch with the participants of Road Tunnel Safety Forum a half day ITA-COSUF Internal Workshop on Safety Challenges took place. Thirty six participants took part including several Safety Officers which participated for the Road Tunnel Safety Forum.

Beforehand, participants were challenged to come-up with personal doubts, questions or the short-comings of safety concepts followed by ideas to improve operational safety.

Steve Collins (Traficant, France) presented 10 steps to successful deployment of automatic incident detection systems in tunnels. After explaining the principles and showing very interesting video footage Steve wrapped-up with tips and tricks for professional AID management with the purpose to help to better protect the road user.

Johan Huovilainen (Marimils, Finland) pointed out the urgent need for intelligent safety systems to provide critical rescue information and emergency lighting. He introduced the MILS-system: a dynamic and intelligent evacuation system based on LED-stripes.

Kees Both (Efectis, the Netherlands) highlighted the results of laboratory and desk research into cracking of fire exposed immersed concrete tunnels and a real fire investigation in a car park in Rotterdam. He also went into the failure mode of hollow core pre-stressed slabs. Kees concluded that immersed and similar tunnel structures suffer from cracking at the unexposed side to fire and such cracks may lead to immediate (shear) failure, or cause severe durability issues in due time.

Niels Peter Hoj (HOJ Consulting GmbH, Switzerland): presented various challenges in risk-based design of road tunnels. He explained a tendency towards more complex design and construction of new tunnels of long lengths, high traffic and underground intersections. It is required that the safety is not only maintained but also improved. It appeared that guidelines codes do not cover the special problems at hand. Niels Peter showed the power of risk analysis to solve these issues.

Christiane Lellig (Basler & Hofmann, Switzerland) showed the criticality of human behaviour to tunnel safety as well as a tunnel's technical outfitting. To her opinion few tunnel safety research projects approach the subject of tunnel safety comprehensively, i.e. investigating both technical and psychological aspects simultaneously. The presentation focused on all factors that have an impact on human behaviour (road users, tunnel operators and rescue staff) in tunnels. Although many questions on human behaviour remain, insight was given on how tunnel safety can be improved by influencing human behaviour such as the tunnel design, processes, communication and training.



Finally Alain Picard (Groupe APRR, France) wrapped up the conclusions of the Forum of the European Road Tunnel Officers. The symposium had lively discussions and handouts of the presentation will be made available at www.ita-cosuf.org.

4. Ben Nieman received first ITA COSUF Award

In order to promote and recognise outstanding activities of young researchers in the field of operational safety of underground facilities, ITA COSUF has created the ITA COSUF AWARD. The award consists of a medal, a certificate and prize money and is granted once a year to a young researcher who has contributed in considerable manner to the development of the safety of underground facilities.



In 2009, the award was conferred to Ben Nieman for his Masters Thesis at the University of Delft, the Netherlands, entitled: "*Cracking on the Unheated Side during a Fire in an Immersed Tunnel*". The thesis treats both from a practical and theoretical side a lurking problem of large cracks at the fire unexposed side of tunnel linings. This is especially relevant to immersed and cut-and-cover tunnels.

ITA COSUF chairman Felix Amberg handed over the award to Ben Nieman on the occasion of the ITA COSUF internal

workshop in Lyon, 5th of November 2009. We congratulate Ben for his exceptional work. Details on the award (criteria, nomination etc) for next year will be put on www.ita-cosuf.org soon.

5. ITA CET Training Course on Management of (User) Safety in Underground Facilities

Training and Education is one of the priority actions of ITA. Hereto, the Committee on Education and Training (ITA CET), the ITA University network is an essential point of the ITA Strategy 2000. In fall 2009 ITA COSUF has established the screenplay of a professional master course on Management of (User) Safety in Underground Facilities. This means that when there is a client, CET and COSUF will be able to co-organize the contents, frames, structures and requirements of a seminar with the objective to provide an introduction to the safe use and operation of underground infrastructures and space with an emphasis on rail, road and metro tunnels. Such a seminar on demand – with would be organised by outstanding tutors, all of which are COSUF members – will provide a general overview to be followed by more in-depth sessions on the management of operational safety during the life of underground facilities, risk associated with the specific of use of the facility, generic safety issues in the use of tunnels. The seminar would be aimed on various target groups Clients, Designers, Consultants and Contractors.

Dinsd 12.11.09:
Ben van den Horn
ITA-COSUF



Seminar on Management of (User) Safety in Underground Facilities

Seminar Objective: to provide an introduction to the safe use and operation of underground infrastructures and space with an emphasis on rail, road and metro tunnels. The seminar will provide a general overview to be followed by more in-depth sessions on the management of operational safety during the life of underground facilities, risk associated with the specific of use of the facility, generic safety issues in the use of tunnels. The seminar is aimed at Clients, Designers, Consultants and Contractors.

Tentative Programme:

Day 1

Session 1: General overview
09.00 – 09.45: Welcome and Opening: ITA and concerned country representatives
09.45 – 10.30: Introduction to Safety Management
10.30 – 11.00: Coffee break

Session 2: Regulations
11.00 – 11.30: Road Tunnel Regulations
11.30 – 12.00: Regulations for Train, Tram and Metro tunnels
12.00 – 12.30: The Impact of New Contract Forms on User Safety
12.30 – 14.00: Lunch

Session 3: An Integrated Risk-Based Approach to User Safety
14.00 – 14.45: PIARC's view on "Holistic" Road Tunnel Safety
14.45 – 15.30: Integrated Safety Analysis for Railway Tunnels/Metro Systems
15.30 – 16.00: Coffee Break

Session 4: Models for Safety Analysis
16.00 – 16.45: Models for probabilistic safety analysis
16.45 – 17.30: Models for deterministic scenario analysis
17.30 – 18.00: Questions and Answers (to all sessions)

Day 2

Session 5: Behavioural Aspect in Safety Analysis
09.00 – 09.45: Injuries and Consequences for Self Rescue and Emergency Aid
09.45 – 10.30: Human Behaviour and Tunnel Safety
10.30 – 11.00: Coffee break

Session 6: Safety Features (part 1)
11.00 – 11.45: Basic Technical Measures for Road Tunnels

Dutch ARCADIS Engineers always Endeavour Improved Operational Safety in Underground Facilities



Operational Safety in Underground Facilities

Many engineers of ARCADIS Netherlands are working for clients with needs to improve operational safety in underground facilities. For instance, infra-providing bodies in the Netherlands have relied on ARCADIS experts like Johan van der Gaag, Dick Toussaint, Kees van der Ende and Rene Baetings in the planning, design and building of new tunnels. Road tunnel managers of existing tunnels have contracted Stefan Lezwijn, Charlotte Boschloo, Harmen van Schaik and many others ARCADIS specialists for the implementation of (inter)national tunnel legislation. Providers of rail infrastructure and metro systems have a long tradition of taking the benefit of the pool of knowledge, for instance the experience of senior advisors Onno Jörg and Bart Duijvestijn when it comes to fire safety and the design of technical safety installations.

Market Developments

The market developments for operational safety issues show a potential for more growth according to senior safety advisor Ben van den Horn: "Accidents in underground infrastructure require strategic decisions about acceptable safety levels. Moreover, the public asks for transparency and efficiency of investments of safety provisions. Every large infrastructure project shows the need for a better project control. And last but not least, a shift in client focus is visible from technical requirements to stakeholder requirements, such as for instance durability aspects in design, building and operation of underground facilities."

Projects

ARCADIS Netherlands proposes an integrated approach to safety based on the complete life cycle of the underground facility. Team leader Bart Duijvestijn: "The strong pool of knowledge available at ARCADIS facilitates an optimal team work within our multidisciplinary projects. Projects that prove the leading position of ARCADIS in the national market are the safety upgrading of the Eastern Metro Link in Amsterdam, the safety management of road tunnels and the fire safety of the new interchange stations in Amsterdam and Rotterdam."

Ambitions to be Leading

ARCADIS Netherlands stands out in skills when it comes to risk analysis and risk management; a key factor is a strong internal and external network, thanks to the continuous recruitment of starting and experienced engineers and consultants. ARCADIS wants to be regarded internationally as leading in solving complex issues regarding operational safety of underground facilities. A first step in this direction has been made. Ben van den Horn: "In 2008 the ITA Committee on Operational Safety in Underground Facilities has asked us to help develop a platform for the exchange of information on client needs and the services and products from the industry. In 2009 an ITA Training Course on Operational Safety was launched, where we will be responsible for part of the training modules. Moreover, Stefan Lezwijn and I have been responsible or supportive for the technical program of various ITA COSUF Workshops."

Contact

If you like to learn more about the services and products of ARCADIS related to operational safety, or if you want to react, please contact: *Ben van den Horn* (ben.vandenhorn@arcadis.nl).

www.arcadis-global.nl

Safety upgrading the Eastern Metro Link in Amsterdam

The 30 year old Eastern Metro Link Renovation Project comprises the renovation of metro stations en the upgrading of fire safety of the interconnecting tunnels.

ARCADIS is contracted by the municipality of Amsterdam to help supervise and prepare risk-based decisions on infrastructure, rolling stock and safety organization. All to warrant optimal incident control, egress and emergency operation during fires incidents.

Rail Tunnel Safety

In 2009 the refurbishment of the 50 year Velsler Railtunnel was completed. ARCADIS contribution was amongst others the design of a new large ventilation concepts in order to meet the safety requirements. This 30 million project was completed with great precision.

Road Tunnel Safety

ARCADIS has been involved in most recent major road tunnel projects in the Netherlands: planning of safety concepts in new tunnels like the A4 Delft Schiedam. The integrated design of the new Coentunnel, A2 Maastricht and safety upgrading of existing tunnels like the Vlaketunnel.