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1. Message from the Chairman

Dear friends,

After the well-known Prof. Dr.-Ing. Alfred Haack, who was the first chairman of ITA COSUF from its creation by the ITA General Assembly in 2005 until 2007, Felix Amberg chaired the committee during 4 years until last May. He has very successfully developed the world-wide membership and influence of COSUF as well as its communication and integration inside ITA. This was demonstrated at the last World Tunnel Congress in Helsinki, where our workshop on “Designing Underground Safety - How far to go?” was among the best-attended and most lively technical sessions of the congress (see section 2 below). Felix and the steering board had chosen a very topical subject and set a team of internationally-renowned speakers and session chairmen who attracted numerous attendees, captured their attention and aroused in-depth discussions.

During the ITA COSUF General Assembly which followed the workshop, and further to cooptation by the Steering Board, Felix proposed that I became the new chairman of the committee. This was kindly supported by the audience: thank you all ITA COSUF members for your confidence! A similar scene occurred on the next day, when the ITA General Assembly confirmed this appointment. Thanks also to the ITA Member Nations for their support!

For more than 20 years, I have been working at CETU (Tunnel Study Centre), a technical body of the French administration strongly involved in underground safety. My international experience has mostly been with the World Road Association (PIARC), as well as the European research projects and regulatory initiatives which followed the Mont Blanc and Tauern tunnel fires. ITA COSUF is not new to me considering that I have been its vice-chair since its inception and the PIARC representative in the steering board. As my PIARC activities are now finished (PIARC internal rules limit the time span of committee members and chairs), a new PIARC representative will be appointed in the COSUF steering board.

I am happy to be given the opportunity to deepen my involvement in ITA COSUF with the help and hopefully for the benefit of all members. ITA COSUF has an important role to play as the unique body fully devoted to operational safety in all types of underground facilities and the



plat-form for communication between all players. To assume this position, I believe three working lines are especially important:

- Give still more visibility to our activities: updated strategic view and working programme should be made available, so that outside bodies and potential ITA COSUF members know what they can expect from us, and current members can decide which activities they take part in;
- Continue to increase membership and simultaneously enlarge the geographical scope (towards Southern and Eastern Europe and other continents) and technical scope too (notably towards more rail and metro representatives);
- Strengthen activity groups as the very basis of ITA COSUF, help them focus their work on topical and stimulating subjects and get visible results thanks to the involvement of as many COSUF members as possible, organisation of devoted workshops/forums, publication of reference papers.

In the continuity of Alfred and Felix, we must work as a team and full support is needed from all ITA COSUF members, activity groups and steering board. I appreciate the continuing participation of Felix Amberg who is now our ITA Tutor. To ensure the transition, a special steering board meeting took place last July at Felix' premises near Zürich. It was the occasion to take stock of recent progress, go deeper into strategy and organise future activities. Among the practical outputs of these joint thoughts, I can mention the following directions (see more on activity groups in section 6 below):

- AG1: continue the successful communication and organisation of events (including ITA COSUF Awards: see sections 3 and 4 below); prepare and update a rolling 12-month programme of ITA COSUF events (see section 8 below);
- AG2, AG3, AG4: decide on a limited number of topical subjects; produce within one year provisional position papers to be published as drafts intended to collect comments from inside and outside ITA COSUF; in a second stage give them a status of recommendations or guidelines to be approved by the steering board;
- AG3: develop the support to master theses and other research works, which will be published on our website and by other means under the ITA COSUF logo;
- AG4: hold a 2nd forum of road tunnel safety officers at the beginning of 2012; propose organisation of future activities.

The next meeting of all ITA COSUF members will be in Amsterdam and Amersfoort on 14 and 15 November. Our Dutch members have prepared a remarkable programme which combines high-level technical presentations and visits, activity group meetings and numerous opportunities to meet around a drink or a common meal (see section 7 below).

I look forward to meeting all of you there so that we can together contribute to the future of ITA COSUF for still better underground safety!

Didier Lacroix



2. Report on ITA COSUF Workshop “Designing Underground Safety – How far to go?” Helsinki, 24 May 2011

This ITA COSUF Workshop took place during the ITA World Tunnel Congress and was open to all congress participants. It attracted approx. 90 participants from many countries.

After the General Assembly of ITA COSUF, the workshop started with a first session dedicated to Hazardous Incidents, Impacts and Loads, chaired by Dr. Götz Vollman, leader of AG3.

Alexander Stolz (Fraunhofer-Institute, Germany) presented a paper on Explosive Impacts, Local and Global Damages. Motivation for this work is an increasing number of terrorist attacks worldwide. Then, Dr. Markus Nöldgen (Schüssler-Plan Consultants, Germany) went into Design Loads and Methods for Explosive Impacts. It became clear that instead of quasi static-static methods, advanced non linear engineering solutions are needed to find a satisfying agreement with the dynamic behaviour of structures. ITA COSUF and PIARC member Arnold Dix presented a very interesting new PIARC report on Design Fires for Road Tunnels. The conclusion was that both prescriptive and performance-based approaches have their place. Design fire sizes can legitimately be reduced using a risk-based methodology that takes account of appropriate mitigation strategies. This report will be published on the PIARC website on short notice. The discussion at the end of the session showed that security should become a more prominent topic within ITA COSUF.



After lunch the audience was welcomed on behalf of ITA COSUF by Felix Amberg, followed by the key note lecture How far to go? of Prof Dr Ira Helsloot (Free University of Amsterdam, The Netherlands). Prof Helsloot addressed ‘Risk and reason’ in tunnel safety and why insane risk



policies cannot be blamed to the intractable citizen. The bottom line of the presentation was that we should not go any further but instead take some steps back when it comes to investments in tunnel safety.



The second session was dedicated to Simulation, Validation and Mitigation Measures and was chaired by Niels Hoj, member of the steering board of ITA COSUF. Prof Dr Haukur Ingason (SP, Sweden) presented a paper on Friendly Fires and Elephant Fires – Simulation, Validation and Mitigation. Prof Ingason stated that the range of design fires for most common tunnel geometries that are meaningful in guidelines and standards are between 5 and 100 MW. Then he concluded that the fire growth rate has to be considered in escape studies and that tunnel fires over 100 MW are not of value for the design. Finally, the design fire can be expressed as a function the air velocity and the tunnel height. Christoph Roller (Fraunhofer - Institute for High-Speed Dynamics, Germany) contributed with a presentation of the Simulation and Validation of Explosions in Confined Spaces, showing the complexity of blast loads in confined spaces. Motivation for his work was security design. Jørn Tredal (Ramboll, Denmark) gave a presentation on Optimizing the Ex-tend of Safety Measures for the Femern Belt Subsea Tunnel, a combined road and rail tunnel that will be built between Denmark and Germany. He went into the three level safety strategy and concluded that the comprehensive package of safety measures of this tunnel will exceed the EU Directives.

The last session on Experienced Gained when Putting into Reality was chaired by Dirk Sprakel, member of the steering board of ITA COSUF. Anders Silver (Trafikverket, Sweden) and Peter Reinke (HBI, CH) took care of the first presentation Similar Projects but Different Safety Measures. It comprised a comparison of the safety concepts of Citybanan (Stockholm), CEVA (Geneva), Durchmesserlinie (Zürich). These projects have in common that 'reasonably acting people' should be given a fair chance of escape and rescue. Besides, saving human life at any cost to the society will be too expensive, even though society is willing to pay more for tunnels. Psychologically, tunnels are perceived as more dangerous than other places: 'Marketing public transportation' requires particular measures to provide public acceptance. The presenters concluded that societies with many tunnels accept a higher residual risk, i.e. are more comfortable with tunnels.



Stefan Kratzmeir went into the SOLIT² Research Project – Fixed Fire Fighting Systems in Tunnels: Compensation and Integration. These systems are meant for reduction of fire spread and improvement of self-rescue conditions for people, easier and safer work of rescue services, reduction of structural damages and compensation of other safety measures. Stefan concluded that FFFS are accepted as a state-of-the-art measure to improve safety in tunnels and in most cases the systems are only used as an additional safety measure. The major aim of FFFS in the future is either to reduce costs with the same safety level or improve safety with the same costs as today. SOLIT² will publish engineering guidance.

Dr. Frank Heimbecher (Federal Highway Research Institute, Germany) presented a contribution on Prescriptive Guidelines vs. Performance-Oriented Approach. Most of the national guide-lines in Europe (e.g. RABT 2006) use a prescriptive approach, but also allow deviations in special cases. In most European countries a quantitative methodology for a performance based approach has been developed and agreed with the relevant authorities, although application might be more difficult than a prescriptive approach. In Germany a performance based approach with prescriptive elements will be used for complex tunnels and tunnels with special characteristics.



Finally, Marleen Elenbaas (Boekel-De Neree, The Netherlands) gave a presentation on Safety Measures and Regulations in the Context of the Law. The focus of this presentation was on what is required according to the law, who is liable/responsible for safety measures and how can responsibilities be dealt with in contracts.

The workshop aroused lively discussions and the presentations will be made available on a CD sent

to COSUF participants. All reactions received afterwards have been very positive: a similar organisation, in close connection with the ITA World Tunnel Congress, should be kept for the 2013 congress in Geneva. In 2012, the ITA COSUF workshop will be held separately (see section 8 below).

3. ITA COSUF Award 2010

In order to promote and recognise outstanding research work of students or young researchers in the field of operational safety and security of underground facilities, ITA COSUF created the ITA COSUF Award in 2009. The award consists of a medal, a certificate and prize money and is granted once a year. The 2010 award was conferred to Mr. Stefan Kratzmeir for his excellent record on tunnel safety research. He worked as a scientific manager, managed R&D applications and is project coordinator of the SOLIT² Research Project. Stefan contributed to European projects like UPTUN, FIT and the German project SOLIT in a high-





level manner, always with a focus on the development of fire fighting and the acceptance of fixed fire fighting systems.

The ITA COSUF chairman Felix Amberg handed over the award to Stefan Kratzmeir on the occasion of the ITA COSUF Workshop in Helsinki on 24 May 2011. We congratulate Stefan for his impressive contributions to develop fire safety to the benefit of the international tunnel safety community.

4. ITA COSUF Award 2012

As the 2010 award could only be delivered at the Helsinki workshop in May 2011 due to the winner's unavailability at the previous workshop, the steering board has decided to directly prepare the 2012 award.

The ITA COSUF Award 2012 will be handed over at the occasion of the open workshop which will take place in Rome on 22 June 2012 (see section 8 below). The winner will be asked to give a brief presentation of his or her work at the workshop. In addition, she/he will be asked to prepare a two-page contribution for the newsletter.

Candidates need not be ITA COSUF members. They should send a file to the ITA secretariat including CV, description of work done in the area of safety and security of underground facilities and relevant documents and publications. The deadline for applications is 29 February 2012. Information will be available on the ITA COSUF website. The selection of the winner will be made by the steering board by mid April 2012.

All ITA COSUF members and other readers of this newsletter are invited to inform possible candidates in their organisations, as well as any other organisation working in the field, and encourage them to apply for the award.

5. Updated ITA COSUF survey on existing road tunnel safety regulations

Under the action plan of AG2, a general survey of existing regulations and recognised recommendations regarding operation and safety of road tunnels has been drawn up and published on ITA COSUF website on 30 April 2008.

This first version was based on the products of the European thematic network FIT (Fire in Tunnels) and a survey launched by COSUF in March 2007, mainly among its members and those of the PIARC Road Tunnel Operations committee.

In February 2011, it was felt necessary to update this document because numerous new regulations and recommendations had been released in the past 4 years. Additionally PIARC was preparing an electronic Tunnel Manual, which has been made available on its website in September 2011. As this manual was to refer to a list of relevant regulations and recommendations, it was decided that it would refer to the COSUF survey rather than duplicate work by launching a specific PIARC survey. This was part of the continuous co-operation between ITA COSUF and PIARC.

The updated document is available on the ITA COSUF website: <http://cosuf.ita-aites.org>. It is the result of this updating process and includes new data received from 27 countries, mainly thanks to information given by the members of the PIARC Road Tunnel Operations committee.



Additionally, the information from international organisations has been updated: World Road Association (PIARC), International Tunnelling and Underground Space Association (ITA), Nordic Road Association (NVF).

6. Report from the activity groups

AG1 Interaction with European and international initiatives

The organisation for the next SB meeting and the workshop in Amsterdam is in full preparation. The COSUF IntroCard (credit card size) is finalised and produced. It is available for COSUF members to hand out to raise interest of potential new members. Members who wish to receive some cards: send an e-mail to jan.mijnsbergen@curbouweninfra.nl.



AG2 Regulations and best practice

AG2 is working on best practice on SCADA systems, smoke removal objectives, particularly for stations, disabled people in emergency situation, and fire protection on platforms with screen doors. As mentioned above, AG2 has recently published an update of the existing data base of regulations regarding road tunnel operation and safety. AG 2 is currently improving its structure in order to stimulate the speed at which output is produced.

Some draft papers have been prepared and will be published to arouse comments from ITA COSUF members and outside bodies, as decided at the last steering board meeting (see section 1 above).

AG3 Research and new findings.

There are quite a number of activities going on. AG3 has succeeded in making quite a good overview on research projects within Europe, and another fairly good overview on emerging technologies. There is good spirit and satisfactory membership participation for the time being. Unfortunately the AG 3 Marie Curie proposal was not successful.

There are some ideas for the future like topics that could be pushed forward by young researchers as ITA COSUF activities. They could be handled as master theses (or otherwise) and supported by ITA COSUF (e.g. proposal of subject, partial funding, travel/contact/stay with relevant experts, ITA COSUF label, dissemination of results, etc.). This idea will be further elaborated.



AG4 Road Tunnel Safety Officers

Since its creation further to the 1st European Forum of Road Tunnel Safety Officers (Lyon, November 2009), AG4 has met three times in order to prepare the 2nd forum, which should take place in Brussels in January or February 2012. All appointed road tunnel safety officers in Europe are invited to attend. The steering board has recently appointed Prof Johan Bosch, the road tunnel safety officer of the Dutch ministry of Infrastructure and Environment, as deputy to AG4-leader Alain Picard.

7. ITA COSUF Workshop in Amsterdam, 14-15 November 2011

All COSUF members are invited to the ITA COSUF internal workshop and AG-meetings on 14 and 15 November 2011 in Amsterdam and Amersfoort in The Netherlands. The workshop will include a technical visit to the Amsterdam Central Station Island, a nodal point of underground infrastructure, including the new North-South Line. The workshop and meetings will be hosted by Arcadis and Efectis.

All ITA COSUF members have received detailed information on the programme and the venues in a dedicated e-mail. We hope to meet you in Amsterdam.

8. Future ITA COSUF events

ITA COSUF workshops and AG meetings

21-22 June 2012	ITA COSUF Open Workshop 2012 and General Assembly, AG and SB meetings, Rome (Italy)
Autumn 2012	ITA COSUF Internal Workshop, AG and SB meetings, Madrid or Barcelona (Spain)
June 2013	ITA COSUF Open Workshop 2013 and General Assembly, AG meetings, Geneva (Switzerland) This event will be organised in conjunction with the ITA World Tunnel Congress, which will take place in Geneva from 31 May till 7 June 2013

Other events organised or endorsed by ITA COSUF

January-February 2012	2 nd European Forum of Road Tunnel Safety Officers, Brussels (Belgium). After the success of the 1st forum organised in Lyon on 4-5 November 2009, ITA COSUF organises the 2nd forum in co-operation with the European Commission and the World Road Association (PIARC). This event will be reserved for Safety Officers. It will be devoted to exchanging experience and preparing guidelines regarding the activity of Safety Officers.
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For all enquiries to ITA COSUF membership please contact Ben van den Horn
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<http://cosuf.ita-aites.org>



9. ITA COSUF member introduction



New organisation for the management of the Swedish transport issues

The Swedish Transport Administration (STA) was formed on 1 April 2010 and it is the largest governmental administration in Sweden. The administration works with all modes of transport and has taken over the tasks of the National Rail Administration (Banverket) and the Swedish Road Administration (SRA).

Our vision is to be world-class creative community builders and to make the good journey and good transports possible.

The STA is responsible for the long-term planning of the transport system for road, rail, shipping and aviation. Our task is to develop an efficient and sustainable transport system from a perspective that encompasses all modes of transport. We work with long-term infrastructure planning in close dialogue with regions and municipalities. We are also responsible for building, operating, and maintaining state roads and railways. In addition, we are responsible to ensure that this infrastructure is effectively used and that it promotes safe and environmentally-sound transports.

The General Director Gunnar Malm has declared 'we are not merging the rail and road administrations, we are creating something new – a transport administration'. This implies a shift in focus; from infrastructure to transport, transport chains and transport systems for the development of the society. And, the work of our 6,500 employees will be based on a clearer customer perspective.

Sweden's road and rail networks and tunnels

The state network comprises 98,400 km of roads, 11,900 km of railway lines and 38 ferry lines. There are 25 road tunnels and 150 rail tunnels within the management of the STA. In performing this work it is essential to include our new vision and business idea: "we evolve and manage smart transport networks for the modern society. We are committed to making everyday life easier; collaborating with stakeholders in society and trade and industry".

With this in mind the STA has found the ITA-COSUF to be a very important arena for contacts and exchange of knowledge on tunnel safety issues. Thus, taking part in the ITA-COSUF work and activities is important for the STA work on tunnel safety.

Swedish Transport Administration

If you would like to know more about the Swedish Transport Administration, please look at www.trafikverket.se at the *English part*. The publication '*Pocket Facts 2010 The Swedish Transport Administration, railways, roads, traffic and transports*' provides an overall picture of railways and roads in Sweden and how they are used.

Under the headline *Railway and Road* you will find information on our main rail- and road projects, including the tunnels.

Contact

If you would like to know more about the Swedish tunnels, in general or specifically on safety, please contact Bernt Freiholtz at bernt.freiholtz@trafikverket.se.