

## **ITA COSUF – SCOPE, STRUCTURE, ACTIVITIES**

### **The Committee on Operational Safety of Underground Facilities of the International Tunneling and underground space Association**

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#### **ABSTRACT**

COSUF – the ITA-Committee on Operational Safety of Underground Facilities was installed in May 2005 following a joint initiative of 8 European research projects which all aimed at an improved tunnel safety. The Committee's scope concerns the operational safety in tunnels and underground facilities in general including also the aspects of security. Starting from this the objectives were defined and a work program derived. For being able to conduct the ambitious work program COSUF formed 3 activity groups. The activity of ITA-COSUF also includes workshops on safety and security related aspects of underground facilities. Details to this and other organizational aspects are described in the full paper.

#### **1. SCOPE AND OBJECTIVES**

COSUF – the ITA-Committee on Operational Safety of Underground Facilities was installed in May 2005 at the occasion of the ITA World Tunnel Congress in Istanbul, Turkey. This important step followed a joint initiative of 8 European research projects which all aimed at an improved tunnel safety after the disastrous fire accidents in various road tunnels in 1999 and the following years. The scope of COSUF initially covered mainly safety in tunnels and other underground facilities but has expanded since in security aspects also. However it is limited to safety / security in operation and not during construction. Safety during the construction of underground facilities is the subject covered by the ITA Working Group No. 5: "Health and Safety".

Within this scope the following objectives as basis for the activities of COSUF are defined:

- maintain and develop a network to:
  - exchange knowledge
  - encourage collaboration
  - facilitate the creation of dedicated teams and groups to perform specific (research) activities
- facilitate cooperation worldwide
- enhance research and development activities through combining of national, regional and international funding and promoting support
- promote safety (and security) by:
  - fostering innovation

- raising awareness of current and newly developed safety (and security) issues amongst decision makers, professional end-users, financiers, risk managers, international forums and other stakeholders
- supporting the development of improved regulations

## **2. BASIC STRUCTURE**

COSUF is headed by a Steering Board (SB) which consisted originally of representatives from the 8 research projects but now has been enlarged to representatives of the major stakeholders within COSUF. The SB is chaired by a chairman as representative of ITA – the International Tunneling Association and a vice chairman as representative of PIARC – the World Road Association. Both are responsible to the annual General Assembly of ITA. The SB is supported in its activities by a secretariat and works in close cooperation with the Tutor, appointed by the Executive Board of the ITA.

COSUF has formed three Activity Groups (AGs) to conduct the manifold activities. These AGs, open for all COSUF members for active participation, generally aim at collection of information, creation of syntheses and recommendations, dissemination of information, identification of current and future needs for research and development giving direction as well as specific initiatives, and other related activities.

The AGs themselves do not carry out studies, research or similar activities of commercial value which could be done by institutes or companies.

The Activity Groups enjoy a high degree of freedom in the definition of their activities according to the intentions, capabilities and contributions of its members; however they are controlled by the Steering Board (SB),

The general objectives of the AGs are

- sufficient safety and security for tunnel users, employees and rescue personnel
- cost efficient solutions for safety and security
- a strive for optimality taking into consideration life-cycle cost and socio-economy and societal demands
- improvements of tunnel safety and security by fostering innovation and with a vision of future possibilities and needs

## **3. ACTIVITY GROUPS AND THEIR WORK PROGRAM**

### *3.1 Activity Group 1: Interaction with European and international initiatives*

AG 1 takes and keeps contact with other external institutions, groups and projects in order to receive relevant information, to co-operate for avoiding duplication of activities, to give information about activities in COSUF to external groups and possibly influence the initiatives.

The activities in Activity Group 1 consist e.g. of

- identifying and liaise with relevant initiatives outside COSUF

- attracting COSUF members from the initiatives or appoint liaison responsible COSUF members
- reporting to Activity Groups 2 and 3 about the results and findings of activities outside COSUF
- reporting transparently to relevant external groups and initiatives about the ideas and results of COSUF
- ensuring that safety and security is given proper priority in initiatives concerning underground facilities
- influencing initiatives to include safety and security aspects in line with the ideas of COSUF
- bringing COSUF ideas to life as projects either as part of existing initiatives or as new separate projects

### *3.2 Activity Group 2: Regulations and best practice*

AG 2 covers regulations, the state-of-the-art and best-practices in various countries. This includes discussion and comparison of regulations and best-practice procedures from different owners, networks, projects and the experience gained by them.

By doing this it is aimed to collect and distribute information on existing national and international regulations and recognised recommendations as well as to establish the best-practice for tunnel safety (and security). As a result it can be identified that

- there is a need of improvement or harmonisation considering regulations in different countries, between networks, between different projects etc.
- the regulations are not up-to-date compared with the recent activities and achievements in practice
- state-of-the-art or state of practice is deviating significantly from region to region, from industry to industry or from institution to institution.

The findings can result in requirements for new regulations.

The work in this Activity Group is part of establishing a global state-of-the-art for tunnel safety and the regulatory tools to control that an adequate safety level is achieved.

The activities cover all safety related aspects such as (at least):

- safety objectives
- basic methods of technical approach (prescriptive and performance-based approaches)
- protection of the structure
- methods for risk assessment
- safety systems and equipment
- interaction with human behaviour
- operation and maintenance
- intervention

The area of security may be highlighted specifically, since there is a need for establishing the state-of-the-art also in this field. Security deviates from safety particularly with respect to the

prevention, whereas the reaction consequence side may be similar to those which are resulting from evaluation and analysis of accidents or so.

### *3.3 Activity Group 3: Research and new findings*

The scope of AG 3 is to motivate to research and to use research results and other new findings for the benefit of safety and security in underground facilities in general.

The activities include

- collection of results of research and collection of new findings
- evaluation of events, results and new findings
- dissemination of the results and new findings among COSUF members
- synthesis of results and new findings into best practices (in collaboration with AG 2)
- collection and evaluation of ideas for research
- identify needs for the future and give directions for future research

The actual launch of new research projects is initiated outside the COSUF frame but certainly facilitated through the activities of COSUF and the AG.

The aim is to make aware all relevant professionals of new findings and recent results of research in the safety and security related activities regarding underground facilities, to discuss these results and other ideas and to process them into specifications of needs of new research into recommended best practices.

The areas covered by AG 3 include the following topics:

- new/innovative equipment in tunnels and new materials
- processes, analyses and design procedures  
integrated design procedures  
risk analyses as part of the design  
fire design techniques etc.
- IT tools in the tunnel design and operation
- test programmes using standardised techniques
- operation and maintenance  
monitoring
- safe intervention, evacuation, fire fighting etc.  
planning  
training  
simulation
- interface tunnel, users, operators and rescue services (human behaviour etc.)
- experience from tunnel incidents, accidents and near misses
- tunnel safety related data collection
- specific security related problems for underground facilities

#### **4. MEMBERSHIP**

COSUF invites all parties world-wide interested in the field of operational safety and security of tunnels and other underground facilities to become member and to co-operate within COSUF. There are exceptionally corporative members, no individual ones.

Currently COSUF has more than 50 members.

#### **5. ACTIVITIES IN THE PAST YEARS**

Considering the aforementioned objectives and structures, ITA COSUF has developed a range of activities during its inauguration, which are listed below:

*Networking and coordination meetings, at least once a year*

Up to now COSUF has held several networking and coordination meetings, at least two every year, 8 up to now. These meetings normally are subdivided in two parts: A meeting of the SB and a meeting of the Activity Groups. Especially the AG meetings allow an intensive networking due to the close interaction between the members of the individual AG but also between the AG.

Also the General Assembly which is held once a year and which is integrated in a larger event (see chapter 5.2.) is an excellent occasion for networking among the members.

*(Co-) organizing workshops and conferences*

COSUF has been very active in organizing workshop and conferences, either as independent COSUF workshop or as a partner in the role of a co-organizer. To mention just a few:

- COSUF workshop on 'Safe and Reliable Tunnels' in Lausanne 2006
- COSUF workshop on 'New aspects in Tunnel Safety' in Prague 2007
- COSUF workshop on 'Safety and Security of Railway and Metro Tunnels' in Graz 2008
- Co-Organization of the conference on 'Fire Suppression in Tunnels' in Munich 2008, together with the International Water Mist Association (IWMA)
- Co-Organization of the 'International Seminar on Tunnel Safety and Security' in Stockholm 2008

Additionally COSUF was contributing to various conferences, seminars and workshops on safety and security with presentations, such as

- joint workshop with the Polish National Tunnel Committee and the Polish Main School of Fire Services, in Warsaw 2006
- participation in the 'International Workshop in Passive Fire Protection for New and Existing Tunnels, in London 2006
- participation in the 'Workshop on Safety in Tunnels and Underground Structures' in Riyadh, 2007

- presentations on 'Fire in Tunnels – Design Options and Possibilities' in Kuala Lumpur and Singapore, 2007

*Actions towards focusing international research programs to include tunnel and underground safety (and security), e.g. in the EU framework programs, European Technology Platforms or other international activities*

Quite many members of COSUF are e.g. active in European and National research and development framework programs. This gives COSUF a good insight of on-going R&D activities and also of corresponding necessities. This knowledge is very useful in the development of joint R&D by the COSUF members and the preparation of proposals and programs.

COSUF also applied for the support of its activities by the so-called COST initiative of the EU.

*Formation of groups and ad-hoc task forces inside the Committee to address issues related to the scope of the Committee and its objectives*

Currently there are several COSUF internal initiatives under discussion to form special groups that could liaise with other European activities such as the European Tunnel Operator Forum and the various national Tunnel Safety Responsibles. This initiatives aims at a better networking and coordination of the relevant activities.

*Developing and maintaining a website within the ITA-AITES website, which will promote its activities and disseminate its findings*

This site has been made active quite some months ago and can be found under the address: [www.ita-aites.org](http://www.ita-aites.org)

We all invite to visit the site and to get further information on ITA COSUF.