

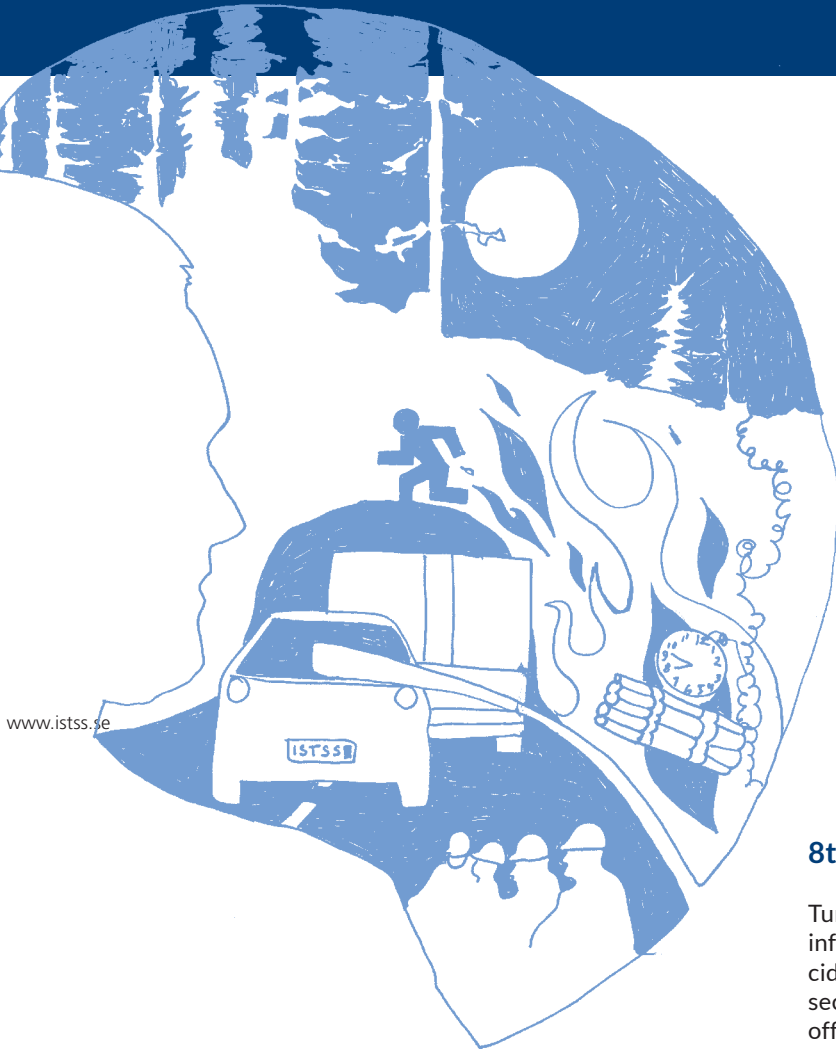
programme

Tunnel Safety & Security

8th International Symposium
14-16th March 2018, Borås, Sweden



ISTSS BEGAN IN SWEDEN IN 2003 as the International Symposium on Catastrophic Tunnel Fires. Interest for the first Symposium clearly identified the need for a conference dealing with safety and security issues related to tunnels. In response to overwhelming interest, the scope of the Symposium was broadened and the event was renamed the International Symposium of Tunnel Safety and Security (ISTSS). The 1st ISTSS was held in Washington, DC, in 2004 and has continued biennially since then attracting more than 250 delegates to each meeting. At RISE, we are proud to have established this prestigious event in collaboration with our event partners.



8thth ISTSS in Borås, Sweden

Tunnels are an increasingly important part of the infrastructure network. They create challenges for incident prevention and management, fire protection and security against attacks or sabotage. This Symposium offers an excellent opportunity for experts working with transport, infrastructure security systems, manufacturers and technical organisations to exchange their experience in an international forum.

The 8th ISTSS Symposium will be held at the:

Skaraborgsvägen 3
506 30 Borås
Sweden

Keynote Speakers



Iain Bowman, Mott MacDonald, UK

Dr Iain Bowman is a Deputy Practice Leader for fire-life safety at Mott MacDonald and has a PhD in supersonic aerodynamics from the University of Cambridge, with over twenty-five years of professional experience. A Chartered Engineer with the Institute of Mechanical Engineers, he has been involved in underground infrastructure fire safety since 2002. Previously, he worked within the manufacturing sector in power generation, aerospace, automotive, maritime, and telecommunications. He has an extensive background in mechanical engineering design, aerodynamics and CFD, and is currently much interested in the intelligent application of risk principles to underground fire-safety design. He currently serves on the Technical Committee for the NFPA 502 standard, and is a member of the Scientific Committee for ISTSS 2018.



Johan Lundin, WSP, Sweden

At present Dr Lundin is a technical director with WSP's Fire and Risk Engineering team in Sweden. He is working with a wide range of risk management and fire safety engineering projects in the areas of land-use planning, property, transport and infrastructure. Examples of ongoing engagements are in Slussen underground buss terminal in Stockholm and in several overdecking projects in the Stockholm area. He has also been involved in developing risk informed decision methods for the Swedish Road Authority and the county board of Stockholm regarding transport of dangerous goods in tunnels.

Johan Lundin has 10 years of experience from research and education at the Faculty of Engineering at Lund University and is specialised in fire safety engineering and risk management. He has been the Director of Studies for the Master's Programme in Risk Management and Safety Engineering at Lund University from the start 2001 until 2005. He presented his doctoral thesis "Safety in Case of Fire - The Effect of Changing Regulations" in 2005 and has thereafter been worked with WSP.



Allan Skovlund, Greater Copenhagen Fire Department, Denmark

Allan Skovlund, Engineer and Incident commander to the Greater Copenhagen Fire Department,

Chairman of the European Fire Service Tunnel Group (EFSTG).

Graduated from the Engineering College of Aarhus, Denmark in 2000 and has been working as project manager in the construction industry until 2010 where he was employed by the Copenhagen Firebrigade (Greater Copenhagen Fire Department since 2016), Fire and Rescue department to develop and evolve preventional and operational plans, strategies and tactics in all tunnels within the district of Greater Copenhagen Fire Department, including the existing and new metro lines.

Member of the EFTSG (European Fire Service Tunnel Group) since 2010.

Trained firefighter, tunnel firefighter (Drägger BG4+), incident commander and studying Master of Fire safety at the Technical University of Denmark.



David Purser CBE

Prof David Purser's work covers all fire hazard development and escape behaviour (ASET-RSET) parameters and their interactions. His research into escape behaviour, fire dynamics, combustion chemistry and fire effluent toxicity

is applied to hazard assessment models, international standards and incident investigations. He has studied hazard development and effects on occupants in several fire incidents in tunnels and underground complexes and served as an expert witness for the Mont Blanc Tunnel fire inquiry. Formerly a Director at BRE, UK, he is currently President of Hartford Environmental Research and Visiting Professor in fire chemistry and toxicity at the University of Central Lancashire. In 2013 he was awarded the Institution of Fire Engineers Rasbash Medal for outstanding contribution to the advancement of knowledge in fire behaviour, and in 2015 he was appointed CBE for services to firesafety.



Hans Brun, The Swedish Defence University, Sweden

Hans Brun is an analyst and researcher within the field of terrorism at the Swedish Defence University, Department of Security, Strategy and Leadership. He has a special focus on counterterrorism and asymmetrical conflicts. Foto: AR Media



Ying Zhen Li, RISE Research Institutes of Sweden

Dr Ying Zhen Li is a senior research scientist at RISE Research Institutes of Sweden. He main research interests are in fire dynamics and fire suppression

in tunnels, fire and explosion hazards of alternative fuel vehicles, scale modelling and CFD modelling of fires. He has been the winner of several prestigious awards, such as the "SFPE Jack Bono Award" and "ITA COSUF Award". He has published over 80 scientific/technical publications concerning fire safety and co-authored the book "Tunnel Fire Dynamics". He serves as guest editor for Fire Safety Journal and also gives lectures to PhD students at Lund University. He is the chairman of scientific committee on "tunnel fire dynamics and smoke control" of the World Transport Convention, co-chairman of the tunnel fire session at IAFSS 2017, and also ISTSS scientific committee member.

Day 1 Wednesday 14 March 2018

08.00	Registration	
09.00-09:20	Opening Session: <i>Margaret McNamee, CTO at RISE Research Institutes of Sweden, Jill Jingbrant, Director of Södra Älvsborg Fire and Rescue Brigade</i>	
	Keynote Session Chair: <i>Prof Haukur Ingason, RISE, Sweden</i>	
09.30-09:55	Security issues in relation to tunnels and underground infrastructure <i>Hans Brun, The Swedish Defence University, Sweden.</i>	
10.00-10.25	Fire Life Safety & Tunnel Systems: Optimising for a Safe and Sustainable Future <i>Dr Iain Bowman, Mott MacDonald, Vancouver, Canada</i>	
10.30-10.50	Coffee break and Exhibits	
	Fire Safety Engineering 1 Chair: <i>Are Wendelborg Brandt, RISE Fire Research AS, Trondheim, Norway</i>	
11:00-11:15	Quantification of a Safety Target for an Underground CNG Bus Terminal in Stockholm <i>Johan Lundin, WSP, Stockholm-Globen, Sweden</i>	
11.20-11.35	Revisiting NFPA 130 Criteria for Emergency Ventilation Systems in Rapid Transit Stations <i>Adrian Milford¹, E. Katherine Fagerlund¹, Peter Senez¹, Andrew Coles¹, Harold Locke²</i> ¹ JENSEN HUGHES, Richmond, Canada ² Locke and Locke, Vancouver, Canada	
11.40-11.55	Fire Protection of Tunnel Joints for the A55 Conwy Immersed Tube Tunnel <i>Fathi Tarada, Karl Else. Mosen Ltd, Forest Row, UK</i>	
12.00-12.15	Public Investigation on fire in tank trailer in the Skate-straum tunnel in Sogn og Fjordane county 15 th of July 2015 <i>Marius H Raddum & Rolf Mellum, AIBN, Accident Investigation Board Norway, Lillestrøm, Norway</i>	
12:20	Wrap up/Questions	
12.30-13:50	Lunch and Exhibits	
	Fire Safety Engineering 2 Chair: <i>Prof Ove Njå, University of Stavanger, Norway</i>	Fire Detection Chair: <i>Dr Ying Zhen Li, RISE, Borås, Sweden</i>
14.00-14.15	A new approach to road tunnel fire safety design <i>Jonatan Gehandler, RISE, Sweden</i>	Interval of Reasonable Threshold on Automatic Fire Detection in Road Tunnels <i>Xinmin Du¹, Changxiu Zhao¹, Shi Yongquan², Hao Zhao¹</i> ¹ Bandweaver Technologies Co., Ltd., Shanghai, China ² Shanghai Tunnel Engineering Co., Ltd., Shanghai China
14.20-14.35	Safety concept for multiple space use <i>Bart Duijvestijn & Charlotte Boschloo, Arcadis Netherlands B.V., Amersfoort, The Netherlands</i>	Methods of grasping smoke movement during road tunnel fires -Aim for safer road tunnel construction <i>Naoya Suzuki¹, Nobuyoshi Kawabata², Masahiro Yokota³, Masataka Yoshioka²</i> ¹ Central Nippon Expressway Company Limited Nagoya Branch / Kanazawa University, Japan ² Kanazawa University, Japan ³ Central Nippon Highway Engineering Tokyo, Japan

14.40-14.55	Common life-safety objectives in traffic tunnels <i>Bo Wahlström¹, Johan Lundin², Oskar Jansson³ & Erik Hällstorp²</i> ¹ Brandskyddslaget AB, Sweden ² WSP Sverige AB, Sweden ³ RiskTec Projektledning AB, Sweden	Development and Application of a Software System on Tunnel Fire Dynamic Early-warning, Evacuation and Rescue Technology <i>Liyang Yu¹, Bo Xiang¹, Dongqing Huang¹ & Zhiguo Yan^{2,3}</i> ¹ Dept. of Computer Science & Technology, East China Normal University, Shanghai, China ² State Key Laboratory of Disaster Reduction in Civil Engineering, Tongji University, Shanghai, China ³ Dept. of Geotechnical Engineering, Tongji University, Shanghai, China
15.00-15.15	Specification of Fire and Life Safety Requirements for Pipeline Utility Tunnels <i>Ian Bowman, Mott MacDonald, Vancouver, Canada</i>	Numerical study of smoke and heat detection on a moving train <i>Anthony Toh, Andrew Harkins & Ricky Carvel , The University of Edinburgh, Edinburgh, UK</i>
15.20	Wrap up/Questions	Wrap up/Questions
15.30-16.00	Coffee break	
Explosions Chair: Dr Jaap Weerheijm, TNO, The Netherlands		
16.00-16.15	Blast wave after hydrogen storage tank rupture in a tunnel fire <i>Volodymyr Shentsov, Dmitriy Makarov & Vladimir Molkov</i> <i>Hydrogen Safety Engineering and Research Centre (HyS-AFER), Ulster University, Newtownabbey, UK</i>	
16.20-16.35	Explosions in road tunnels <i>Mirjam Nelisse & Ton Vrouwenvelder</i> <i>TNO Netherlands Organisation for Applied Scientific Research, Delft, The Netherlands</i>	
16.40-16.55	Study of fire and explosion hazards of alternative fuel vehicles in tunnels <i>Ying Zhen Li, RISE Research Institutes of Sweden, Borås, Sweden</i>	
17.00-17.15	Dense gas dispersion in tunnel An evaluation of CFD codes <i>Benjamin Truchot & Guillaume Lecocq, INERIS, France</i>	
17.20	Wrap up / Questions	
Posters (Speakers) Corner Chair: Prof Anders Lönnermark, RISE , Sweden		
17.30-18.00	Each poster presenter has two minutes to quickly explain their poster	
18.00-19.00	Cocktail Reception and Poster Session	

Day 2 Thursday 15 March 2018

08.00	Registration	
	Keynote Session Chair: Prof Anders Lönnermark, RISE, Borås, Sweden	
08.30-08.55	Overview of Tunnel Fire Research <i>Dr Ying Zhen Li, RISE Research Institutes of Sweden, Borås, Sweden</i>	
09.00-09.25	Risk Evaluation and Risk Control in Road Overbuilding of Transport Routes for Dangerous Goods <i>Dr Johan Lundin, WSP, Stockholm-Globen, Sweden</i>	
	Risk analysis 1 Chair: Prof Anders Lönnermark, RISE, Borås, Sweden	
09.30-09.45	Fire Incident and Fire Safety Operational Data for Major Australian Road Tunnels <i>Nigel Casey, Roads and Maritime services, Sydney, Australia</i>	
09:50-10.05	Development of a Risk-based Framework for Design and Operations <i>Robin Hall¹ & Iain Bowman²</i> ¹ Mott MacDonald, Croydon, United Kingdom ² Mott MacDonald, Vancouver, Canada	
10.10	Wrap up/Questions	
10.20-10.45	Coffee break and Exhibits	
	Risk analysis 2 Chair: Jonatan Gehandler, RISE Sweden	Fire Safety Engineering3 : Case studies Chair: Gary English, Seattle Fire Department, USA
10.50-11.05	Guidance and Methods for Categorizing Road Tunnels According to Dangerous Goods Regulations (ADR) <i>Johan Lundin, Lars Antonsson, WSP, Stockholm-Globen, Sweden</i>	Safety Related Challenges when Designing Sustainable Cities – A Practical Example with an Underground CNG Bus Terminal <i>Göran Nygren, Björn Yndemark & Johan Lundin, WSP, Stockholm-Globen, Sweden</i>
11.10-11.25	A Quantitative Estimate of the Probability of Train Fire in an Urban Light Rail Tunnel <i>Ian Bowman, Mott MacDonald, Vancouver, Canada</i>	Designing Rail Tunnel Fire Safety in Sweden – A Case Study on the Precision of Hand Calculative Methods for Rail Tunnel Safety <i>Axel Mossberg, Niclas Åhnberg, Hans Nyman & Robert Jansson McNamee, Brandskyddslaget, Stockholm, Sweden</i>
11.30-11.45	Rail System Ventilation Rehabilitation <i>Matthew Bilson¹, Andrew Purchase², Lily Liu¹, Nicole Nishimura¹, Silas Li¹ and Bo Rim Seo¹</i> ¹ WSP, New York ² WSP Gothenburg	Feasibility study: Dimensioning passenger loads in underground railway stations <i>Karin Magnusson¹, Katja Berdica¹, Christian Nilsson¹ & Johan Häggström²</i> ¹ WSP Sverige AB, Göteborg, Sweden ² Swedish Transport Administration, Stockholm, Sweden
11.50-12.05	Risk analysis for road tunnels – a metamodel to efficiently integrate complex fire scenarios <i>Florian Berchtold¹, Christian Knaust¹, Lukas Arnold², Sebastian Thöns³ & Andreas Rogge¹</i> ¹ Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany ² Forschungszentrum Jülich, Jülich, Germany ³ Technical University of Denmark (DTU), Lyngby, Denmark	Too Much Ventilation for Short Tunnels <i>Silas Li, Andrew Louie, Salvatore Marsico, WSP, USA</i>
12:10	Wrap up/Questions	Wrap up/Questions
12.20-13:30	Lunch and Exhibits	

Ventilation		Fire Safety Engineering 4: State of the art
Chair: Prof Peter Sturm, Graz University of Technology, Austria		Chair : Dr Nick Agnew, Stacey Agnew P/L, Australia
13.40-13.55	Revisiting NFPA 130 Criteria for Emergency Ventilation Systems in Rapid Transit Stations <i>Adrian Milford</i> ¹ , <i>E. Katherine Fagerlund</i> ¹ , <i>Peter Senez</i> ¹ , <i>Andrew Coles</i> ¹ , <i>Harold Locke</i> ^{2,1} <i>JENSEN HUGHES</i> , Richmond, Canada, ² <i>Locke and Locke</i> , Vancouver, Canada	Effects of Tunnel Design on Tunnel Evacuation <i>Gary English</i> , <i>Underground Command and Safety</i> , Vashon, USA
14.00-14.15	Craeybeckxtunnel from fire test to new ventilation strategy <i>Xavier Deckers</i> ¹ , <i>Jef Vercammen</i> ² <i>Pachera Matteo</i> ¹ , <i>Fire Engineered Solution Ghent</i> , Belgium ¹ <i>Fire Engineered Solution Ghent</i> , Ghent, Belgium ² <i>Wegen en Verkeer Antwerpen</i> , Belgium	The Art of Refurbishment of In-Service Tunnels <i>Leander Noordijk</i> , <i>Ben van den Horn & Bart Duijvestijn</i> , <i>Arcadis Netherlands</i> , Amersfoort, The Netherlands
14.20-14:35	Proof of proper functionality of emergency ventilation system in emergency stations of GBT using fire tests and CFD simulations <i>Rehan Yousaf</i> , <i>Christoph Brander</i> , <i>Jens Badde</i> , <i>Martin Viertel & Erwin Eichelberger</i> , <i>Pöyry Switzerland Ltd</i> , Zurich, Switzerland	Simulation of Fire Propagation in Cable Tray Installations for Particle Accelerator Facility Tunnels <i>Tristan Hehnen</i> ^{1,2} , <i>Lukas Arnold</i> ³ , <i>Patrick van Hees</i> ⁴ & <i>Saverio La Mendola</i> ² ¹ <i>Bergische Universität Wuppertal</i> , Germany ² <i>European Organization for Nuclear Research CERN</i> , Geneva, Switzerland ³ <i>Institute for Advanced Simulation, Forschungszentrum Jülich</i> , Germany ⁴ <i>Lund University</i> , Lund, Sweden
14.40-14.55	A computational study of critical velocity in rail tunnels <i>Cristian Biotto</i> ¹ & <i>Jarrod Alston</i> ² ¹ <i>Aurecon</i> , Melbourne, Australia ² <i>Arup</i> , Melbourne, Australia	Fire safety engineering method evaluation based on a real tunnel fire case <i>Benjamin Truchot & Guillaume Leroy</i> , <i>INERIS</i> , Verneuil en Halatte, France
15.00	Wrap up/Questions	Wrap up/Questions
15.10-15.30 Coffee break and Exhibits		
Fyre Dynamics		
Chair: Dr Ricky Carvel, University of Edinburgh, UK		
15.40-15.55	Hot smoke tests for smoke propagation investigations in long rail tunnels <i>Peter Sturm</i> ¹ , <i>Johannes Rodler</i> ² , <i>Thomas Thaller</i> ³ , <i>Johannes Kari</i> ³ , <i>Daniel Fruhwirt</i> ¹ , <i>Patrick Fößleitner</i> ¹ ¹ <i>Graz University of Technology</i> , Austria ² <i>FVTmbH Graz</i> , Austria ³ <i>ÖBB Infrastruktur AG</i> , Austria	
16.00-16.15	Applying the FDS pyrolysis model to predict heat release rate in small-scale forced ventilation tunnel experiments <i>Xiaoyun Wang</i> ¹ , <i>Charles Fleishmann</i> ² & <i>Michael Spearpoint</i> ^{2,3} ¹ <i>Arup Fire</i> , Melbourne, Australia ² <i>Civil and Natural Resources Engineering</i> , University of Canterbury, Christchurch, New Zealand ³ <i>Olsson Fire & Risk</i> , Manchester, UK	
16.20-16.35	The experimental approach to the smoke behaviour on slope in road tunnel <i>Shoichi Kume</i> ¹ , <i>Christof Sistenich</i> ² & <i>Felix Wawrzyniak</i> ² ¹ <i>Hanshin Expressway Company Limited</i> , Osaka, Japan ² <i>The Federal Institute of Highway Technology</i> , Bergisch Gladbach, Germany	
16.40-16.55	Sprinklers and Major Fire Spread in a Tunnel: A Theoretical Model <i>Alan N Beard</i> , <i>Civil Engineering Section</i> , <i>EGIS School</i> , <i>Heriot-Watt University</i> , Edinburgh, Scotland, UK	
17.00	Wrap up/Questions	
19.00	Banquet	

Day 3 Friday 16 March 2018

08.00	Registration
	Keynote Session Chair: Mia Kumm, RISE, Sweden
08.30-08.55	Fire Brigade Intervention Capability and Technical Trade-Offs in the Copenhagen Metro Cityring Tunnel <i>Allan Skovlund, Greater Copenhagen Fire Department, Denmark</i>
09.00-09.25	How to determine toxic effects and human behaviour when exposed to fire smoke in underground facilities – challenges and possibilities <i>Prof David Purser, Hartford Environmental Research, Hatfield, United Kingdom.</i>
	Fixed Fire Fighting Systems (FFFS) Chair: Mia Kumm, RISE Sweden
09.30-09.45	Functions of Water Spray Systems in Japanese Expressway Tunnels <i>Masahiro Yokota & Kenichiro Yamazaki, Central Nippon Highway Engineering Tokyo Co., Ltd., Japan</i>
09.50-10.05	Large scale fire tests with different types of fixed fire fighting systems in the Runehammar tunnel <i>Haukur Ingason & Ying Zhen Li</i> RISE Research Institutes of Sweden, Borås, Sweden
10.10-10.25	Expediting implementation of FFFS in road tunnels <i>Kenneth J. Harris & Michael C. Macniven, WSP, California, USA</i>
10.30	Wrap up/Questions
10.40-11.00	Coffee break and Exhibits
	Evacuation and Human Behavior Chair: Dr Håkan Frantzich, Lund University, Sweden
11.10-11.25	An integrated approach for fire evacuation safety assessment in underground physics research facilities <i>Enrico Ronchi¹, Silvia Arias¹, Saverio La Mendola² & Nils Johansson¹</i> ¹ Department of Fire Safety Engineering, Lund University, Sweden ² CERN, European Organization for Nuclear Research
11.30-11.45	Evacuation Tests with Elevated Platforms in Railway Tunnels <i>Eva-Sara Carlson¹, Mia Kumm^{1,2}, Anne Dederich¹ & Artur Zakirov¹</i> ¹ RISE Research Institutes of Sweden, Borås, Sweden, ² Mälardalen University, Västerås, Sweden
11.50-12.05	A Methodology for Assessing Driver Behaviour and Improving Safety and Customer Experience in Long Urban Road Tunnels <i>Nigel Casey¹, Michael A. Regan², Asif Hassan²</i> ¹ Roads and Maritime Services, Sydney, Australia ² Australian Road Research Board, Sydney, Australia
12.10-12.25	Improvements in the awareness and behaviour of road tunnel users over a ten-year period <i>Michael Potier, Marie-Noëlle Marsault</i> Centre for tunnel studies, Bron, France
12.30	Wrap up/Questions
12:40-13.00	Panel Discussion Chair: Prof Haukur Ingason, RISE
13.00-13.50	Lunch and Exhibits
14.00	Buss Departure for Technical visit

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ITA-COSUF – ITA Committee on Operational Safety of Underground Facilities

ITA-COSUF is the Centre of Excellence for world-wide exchange of information and know-how regarding safety and security of underground facilities. It is part of the International Tunnelling and Underground Space Association (ITA) and is supported by PIARC, the World Road Association. ITA-COSUF covers all types of underground facilities and can therefore deal with overlaps and differences for instance between underground road and rail infrastructures. ITA-COSUF workshops are important means of communication; both internal workshops to exchange views with colleagues in a 'safe environment' as well as open workshops to share views and experience with the 'outer world'. A large part of ITA-COSUF thinking and outputs relies on various Activity Groups.



Norwegian Tunnel Safety Cluster

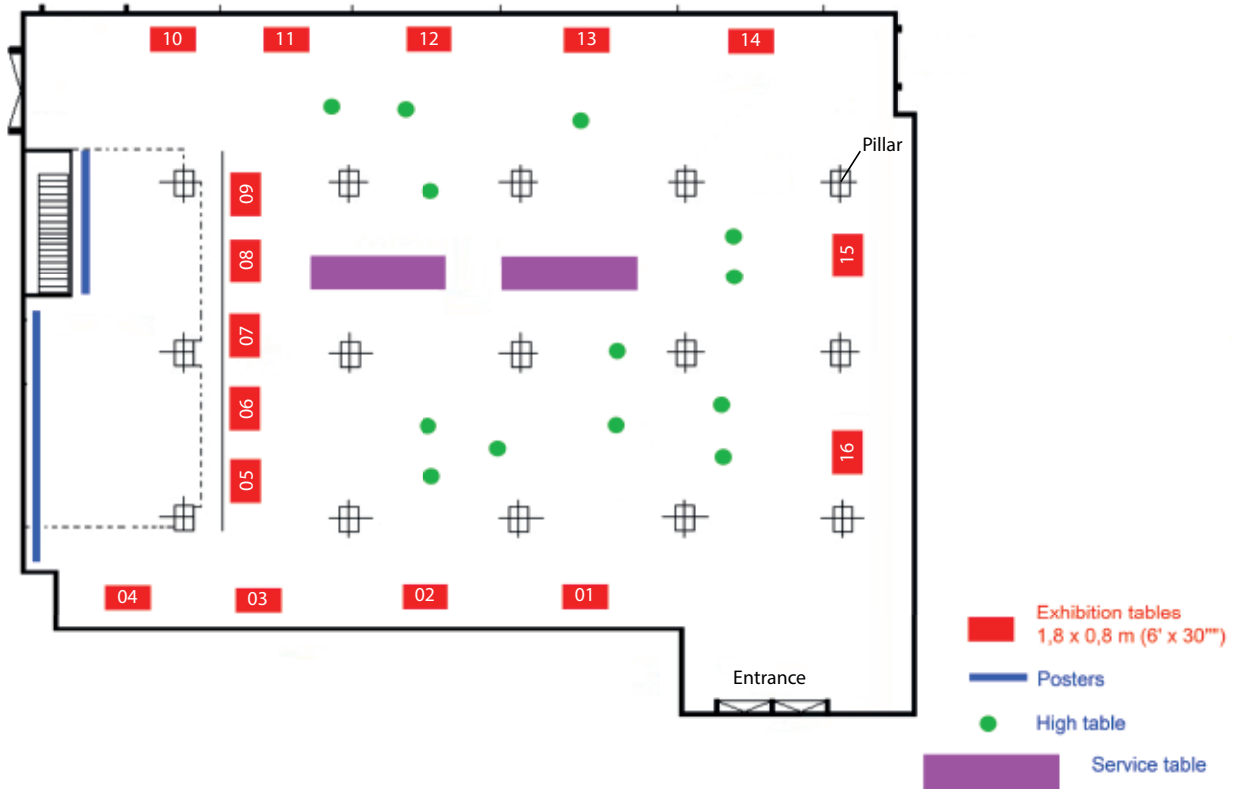
The Norwegian Tunnel Safety Cluster (NTSC) is incorporated into the Norwegian Innovation clusters (NIC) programme. The cluster comprises of over 100 participants, more than 90 companies, seven R&D/academic and innovation centres, and eight public sector organisations, including the emergency services.

The mission is to develop an innovative cluster where members succeed in commercialising solutions for improved tunnel safety. This will contribute towards safer tunnels and fewer accidents – vital to road users, the fire and rescue services, the transport sector and local communities everywhere.

Banquet dinner sponsor

Stacey Agnew

Exhibition floor plan



Exhibitors



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TBM: Tunnel Business Magazine is the leading publication covering all facets of the North American tunneling market. Launched in 1998, TBM is a bimonthly publication that reaches more than 5,000 construction professionals, delivering the latest news and information on project updates, technical topics and issues shaping the market.



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First published in 1969, Tunnels and Tunnelling International continues to hold the highest reputation of any magazine in the regional tunneling industry and is today a leading source of information about the business you are in, that's 47 years of continuous service to the industry. Tunnels and Tunnelling International is also the official magazine of the British Tunnelling Society, which plays an active part in ensuring the publication maintains its unique well-informed overview of the whole industry. This is achieved through input from an Editorial Advisory Board, a committee of internationally respected tunnelling experts. Through face to face contact with clients, project development groups, consulting engineers, contractors and equipment and material suppliers Tunnels and Tunnelling International is a comprehensive record of what's new, what's in the planning stage, what's ready to bid and what's in construction; keeping today's tunnelling professional informed and ahead. The subscribers to this long established market-leading magazine are civil engineering tunnelling



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