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TUNNEL SAFETY AND VENTILATION

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PREFACE

Ladies and Gentlemen, dear Participants,

This conference series started in 2002 in order to provide a forum for information exchange among operators, users, technicians, scientists and companies involved in the design, construction and equipping of road and rail tunnels. The success of the 2002 conference led to the organization of biennial follow up meetings.

While the first conferences were strongly influenced by the tunnel incidents of the late 1990's and related safety issues, nowadays road tunnel operation, the conflict between the needs for upgrading existing road tunnels and requirements given in a legal framework dominate. With the introduction of vehicles propelled by new energy carriers (NEC) new challenges for tunnel safety popped up. Especially the management and handling of fires with battery electric vehicles and hydrogen vehicles require attention and research into these issues is still going on.

Road traffic is increasing, at both a national as well as an international level. Thus, while in densely populated areas there is much greater demand for sub-surface transportation, in rural areas there is an increasing need to upgrade the road infrastructure. The upgrading process constitutes a big challenge in practice, as – in contrast to new tunnel construction – several prevailing structures and systems act as constraints and have to be taken into consideration in planning. There is also the additional need to ensure that traffic flow can be maintained throughout the construction period.

Investments in rail traffic in Austria resulted in the construction of three major rail tunnel. While the construction of the tracks and electrical installations is already underway in the 38 km long Koralm Tunnel, the breakthrough of the first tube in the Semmering Base Tunnel (28 km) is expected in mid-May 2022 and the second tube in autumn 2022. The Brenner Base tunnel with 55 km connects Austria and Italy, construction is in progress. These projects exhibit, based on their history and complexity, very high requirements and challenges for all parties involved in construction and operation.

The question of tunnel safety is a highly controversial field. It is often claimed that several new techniques are now on the market and that these can help improve safety due to quicker and more reliable detection, more efficient installations and/or additional equipment. However, such 'improvements' often result in significant increases in complexity, as well as in the cost of operation and maintenance of the new safety equipment.

This conference wouldn't be the "Graz" conference without the related exhibition. Many companies have put a lot of effort into presenting their latest developments and technologies. Conference participants now have the chance to get into contact with leading companies in the electro-mechanical tunnel business, to establish new contacts, and also to strengthen existing ones.

Another exciting and distinguishing aspect of the "Graz" conference is the accompanying technical visit. After many years of negotiations concerning financing, legal aspects, and finally it's erection, the research center "ZaB - Zentrum am Berg" is now under operation in a dedicated part of the Styrian Erzberg (an open-pit iron mine in operation since the 11th century). Trainings of first responders to tunnel incidents are also part of the daily business, as well as research in

mining and construction of tunnels. A special focus is on full scale fire tests for system development and tunnel safety related issues. The visit of the ZaB in the framework of the conference contains a tour to the new tunnel tubes currently under construction followed by fire tests.

We wish to extend a special thank you to our scientific committee for its valuable work in defining the objectives of this conference, and in selecting the presentations.

We also extend our professional thanks to the authors for their hard work in preparing abstracts, papers, posters, and of course their presentations.

And finally, we wish to offer our sincere thanks to all the people in the background who have been working to ensure that this will be a smooth, enjoyable and effective conference for us all.

After holding the last conference as a virtual event and missing all positive effects of face to face meetings, I hope that this years' conference will build on the very successful events of the pre-Corona years. It is my pleasure to welcome you all on behalf of the conference scientific committee and to wish you all a successful meeting and a sound basis for fertile networking in the future.

Peter J. Sturm

Graz, May 2022

CONTENS
“TUNNEL SAFETY AND VENTILATION”
Graz, 09. – 11. May 2022

Preface

TUNNEL VENTILATION AND SAFETY, 10 CONFERENCES – THE STORY SO FAR	1
Peter Sturm Graz University of Technology	
ROAD INFRASTRUCTURE AND SUSTAINABILITY – HOW DOES IT FIT TOGETHER?	11
Andreas Fromm ASFINAG Bau Management GmbH, AT	
TUNNEL VENTILATION AND UN 2030 SUSTAINABILITY GOALS – WE HAVE A STORY TO TELL	13
Arnold Dix Legal Counsel White & Case Professor of Engineering Tokyo City University, JP President Elect ITA	
CURRENT STATUS OF THE WORK IN PIARC'S TECHNICAL COMMITTEE 4.4 TUNNELS	18
Ingo Kaundinya Federal Highway Research Institute (BAST), Chairman of PIARC TC 4.4 Tunnels, DE	
TUNNEL PERFORMANCE TEST	25
¹ Günter Rattei, ² Ulrike Stiefvater ¹ ASFINAG Service GmbH, AT, ² KFV, Kuratorium für Verkehrssicherheit, AT	
NFPA 502: A REPORT ON STANDARD UPDATES AND ACTIVITY	31
¹ Norris Harvey, ² Iain Bowman, ² Yinan Scott Shi ¹ Mott MacDonald, US ² Mott MacDonald, CA	
ON SMOKE STRATIFICATION IN A 1-D TUNNEL VENTILATION MODEL	39
Ingo Riess, Riess Ingenieur-GmbH, CH	
NUMERICAL INVESTIGATION OF THE KORALM TUNNEL FIRE TESTS USING AN AUTONOMOUS MESHING APPROACH WITH ADAPTIVE MESH REFINEMENT	47
¹ Mathias Vångö, ¹ Pietro Scienza, ² Patrik Föbtleitner, ³ Daniel Fruhwirt ¹ Convergent Science GmbH, AT ² FVT mbH, AT ³ Graz University of Technology, AT	
CFD VALIDATION FOR TUNNEL SMOKE CONTROL DESIGN	55
¹ Michael Beyer, ^{1,2} Conrad Stacey ¹ Stacey Agnew Pty Ltd, AU ² SAMJ LLC, US	

SELECTION OF A ROAD TUNNEL VENTILATION SYSTEM USING VENTSIM SOFTWARE	75
<u>¹Marek Borowski</u> , ¹ Szmuk Andrzej, ¹ Zwolińska Klaudia ¹ AGH University of Science and Technology, PL	
ON HEAT TRANSFER COEFFICIENTS AND TEMPERATURE DISTRIBUTION IN LONGITUDINALLY VENTILATED TUNNEL FIRES	83
Milan Šekularac University of Montenegro, ME	
METHODOLOGY FOR INVESTIGATIONS ON THE TUNNEL CLIMATE IN LONG RAILWAY TUNNELS - OPTIMIZATION OF THE DESIGN PROCESS FOR CROSS-PASSAGE COOLING SYSTEMS	93
<u>¹Daniel Fruhwirt</u> , ¹ Peter Sturm, ² Helmut Steiner ¹ Graz University of Technology, ITnA, AT ² ÖBB Infrastruktur AG, AT	
EMPIRICAL VALIDATION OF SEASONAL 1D TEMPERATURE PREDICTIONS IN A 9 KM NORDIC TRAIN TUNNEL	113
<u>¹Erik Östblom</u> , ² Per Sahlin ¹ EQUA Solutions AB, SE ² EQUA Simulation AB, SE	
THE PISTON EFFECT TEST BENCH FOR THE GRAND PARIS EXPRESS	121
<u>¹Elisa BERAUD</u> , ¹ Fabien JOUVE, ¹ Benoît HOUSEAUX ¹ Eiffage Énergie Systèmes, Ventilation of tunnel & underground spaces, FR	
RAPID FIRE DETECTION AND NOTIFICATION USING A DUAL THERMAL+OPTICAL CAMERA	129
<u>¹Takuya Matsumoto</u> , ¹ Tatsuya Oshiro, ¹ Kazuki Furuhashi, ² Hideyuki Uemura, ³ Alan Vardy ¹ Sohatsu Systems Laboratory Inc., Kobe, JP ² Teledyne FLIR, Osaka, JP ³ University of Dundee, Dundee, Scotland, UK	
EXPERIMENTAL STUDY ON GENDER DIFFERENCE IN MENTAL STRESS AND WALKING SPEED DURING TUNNEL FIRES	136
<u>¹Wenhao Li</u> , ¹ Miho Seike, ¹ Akimasa Fujiwara, ¹ Makoto Chikaraishi ¹ Hiroshima University, JP	
ON THE ACCURACY OF FDS SMOKE PROPAGATION MODELS IN THE CONTEXT OF TUNNEL RISK ANALYSIS	144
<u>¹Oliver Heger</u> , ² Peter Sturm ¹ ILF Consulting engineers Austria GmbH, AT ² Institute of Thermodynamics and Sustainable Propulsion Systems, Graz University of Technology, AT	
UPGRADE OF THE GERMAN METHODOLOGY FOR TUNNEL RISK ASSESSMENT	155
<u>¹Georg Mayer</u> , ² Harald Kammerer, ³ Christoph Zulauf, ⁴ Christof Sistenich ¹ BUNG Ingenieure AG, DE ² ILF Consulting Engineers Austria GmbH, AT, ³ EBP Schweiz AG, CH, ⁴ Bundesanstalt für Straßenwesen (BASt), DE	

INFLUENCE OF ALTERNATIVE ENERGY CARRIERS ON TUNNEL SAFETY – A QUANTITATIVE CONSEQUENCE ANALYSIS	161
¹ Anne Lehan, ² Regina Schmidt, ³ Patrik Föbtleitner, ¹ Harald Kammerer ¹ BAST, DE ² ILF Consulting Engineers, AT ³ FVTmbH, AT	
THE APPLICATION OF ZONE MODELLING IN THE RISK ANALYSIS OF TUNNELS WITH ARTU SOFTWARE	169
¹ Michele Fronterre, ¹ Rugiada Scozzari ¹ Cantene s.r.l., IT	
FIERCE: A COST BENEFIT ANALYSIS FOR TUNNEL FIRE SAFETY	178
¹ Melchior Schepers, ¹ Xavier Deckers, ² Jovanović Balša, ² Chaudhary Ranjit Kumar, ² Van Coile Ruben ¹ Jensen Hughes, Ghent, BE ² Department of Structural Engineering and Building Materials, Ghent University, Ghent, BE	
INFLUENCE OF THE REDUNDANCY OF TUNNEL VENTILATION SYSTEMS ON THE AVAILABILITY OF ROAD TUNNELS	185
¹ Leonhard Pölzer, ¹ Maximilian Weithaler, ¹ Reinhard Gertl, ² Markus Gröblacher ; ¹ ILF Consulting Engineers Austria GmbH, AT ² ASFINAG Bau Management GmbH, AT	
VALIDATION OF A MODEL ROAD TUNNEL USING FIRE EXPERIMENTS DATA	193
¹ Andreas Klein, ² Wilhelm Jessen, ³ Christof Sistenich ¹ ISAC GmbH, Aachen, DE ² Institute of Aerodynamics, RWTH Aachen University, DE ³ Federal Highway Research Institute (BAST), Bergisch Gladbach, DE	
EGRESS-DOORS IN ÖBB RAILWAY TUNNELS - BASICS, DECISIONS, RECOMMENDATIONS	201
¹ Helmut Steiner, ² Michael Bacher ¹ ÖBB Infra, AT ² Graz University of Technology, AT	
RECOMMENDATIONS TOWARDS THE STANDARDIZATION OF THE VENTILATION EQUIPMENT IN ROAD TUNNELS	210
Justo Suárez INGENIERIC, ES	
ON THE RISK OF A PRESSURE VESSEL EXPLOSION INSIDE ROAD TUNNELS	217
¹ Jonatan Gehandler, ¹ Chen Huang, ¹ Ying Zhen Li, ¹ Anders Lönnermark ¹ RISE Research Institutes of Sweden, SE	
DETERMINATION OF AERODYNAMIC LOADS IN RAIL TUNNELS USING MEASUREMENTS	223
Johannes Rodler FVTmbH, AT	

INCREASING SAFETY AND SECURITY BY USING MODERN INTERDISCIPLINARY APPROACHES FOR UNDERGROUND FACILITIES	232
¹ <u>Nina Gegenhuber</u> , ¹ Robert Galler ¹ Montanuniversität Leoben/Chair of Subsurface Engineering, AT	
FEASIBILITY STUDY INTO THE IMPLEMENTATION OF ZERO FLOW TUNNEL VENTILATION IN THE SCHIPHOL KAAGBAAN TUNNEL	240
Hans Beljaars Royal HaskoningDHV, NL	
VENTILATION STRATEGY AND DESIGN OF INTERTWINING TUNNELRAMPS, OOSTERWEEL LINK ANTWERP	249
¹ <u>Thijs Bouwhuis</u> , ¹ Tamara Dolle, ² Aryan Snel ¹ RoTS / Witteveen+Bos, Amsterdam, NL ² Lantis / RoTS, Antwerpen, BE	
RISK-BASED VENTILATION DESIGN STUDY FOR THE LA LINEA TUNNEL	257
¹ Jorge Luis Rios Portilla, ² <u>Juan-Carlos Rueda</u> , ² Harald Kammerer, ² Reinhard Gertl, ³ Bernhard Kohl ¹ DISICO S.A Ingeniería Eléctrica, Civil y Telecomunicaciones, CO ² ILF Consulting Engineers Austria GmbH, AT ³ ILF Group Holding GmbH, AT	
TESTING THE THRUST OF JET FANS IN A WIND TUNNEL	265
¹ Tomasz Burdzy, ¹ <u>Wojciech Węgrzyński</u> , ² Marek Borowski ¹ Fire Research Department, Building Research Institute (ITB), PL ² AGH University of Science and Technology, Krakow, PL	
MEASUREMENTS AND CFD CALCULATIONS WITH A MOJET AND A CONVENTIONAL JET FAN	275
¹ <u>Fathi Tarada</u> , ² Lars Lehmann, ¹ Pier Bertacche ¹ Mosen Ltd, Forest Row, UK ² TLT-Turbo GmbH, Zweibrücken, DE	
BEST PRACTICE FOR SELECTION OF FAN- AND DRIVE TECHNOLOGY IN TUNNEL VENTILATION APPLICATIONS	283
¹ <u>Simon Frey</u> , ¹ Matthias Lempp, ¹ Christina Zimmermann, ² Stefan Herger, ³ Jürg Pargätzi, ⁴ Diego Tschuppert ¹ HBI Haerter AG, CH ² Brüniger + Co. AG, CH, ³ Parmeltec GmbH, CH, ⁴ FEDRO, CH	
EVERY SECOND COUNTS - THE SAFETY OF PEOPLE AND GOODS IN TUNNELS. BEST PRACTICE: INNOVATIVE FIRE AND SECURITY SOLUTION USING THE EXAMPLE OF "ZENTRUM AM BERG".	291
Wolfgang Lahner Honeywell/Honeywell Life Safety Austria GmbH, AT	
AN AFFORDABLE & SUITABLE ALTERNATIVE: LED RETROFIT TUNNEL LIGHTING	295
¹ Thomas Nessel, ² <u>Markus Keller</u> , ¹ ASFiNAG Service GmbH, AT ² ASFiNAG BMG, At	

VENTILATION IN SHORT TUNNELS AS A RISK MITIGATION MEASURE: "A SHORT TUNNEL CAN BE AS DANGEROUS AS A LONG ONE"	300
D. Benitez Forero Electromechanics Department, Integral S.A., CO	