V10

20th International Symposium on
Aerodynamics, Ventilation and Fire in Tunnels
ISAVFT 2024
Copenhagen, 28th - 30th October 2024

Sunday 27th October 2024

16:00 **Registration Reception Sponsored by Zitron**
17:00 **Open to all delegates**

Monday 28th October 2024

08:00 **Morning Registration**

09:30

Symposium Chairman Welcome
Dr. Rune Brandt, Chairman of the Board of Directors, HBI Haerter AG, Switzerland

Dr Rune Brandt heads the renowned and internationally reputed consultancy HBI Haerter. Since 1963, the tunnel ventilation and the safety concept of more than 1000 tunnels worldwide have been designed by HBI Haerter that has offices in Switzerland, Germany and Australia. Moreover, pollutions dispersion modelling and risk assessment is part of the core services. HBI Haerter follows projects during their entire evolution from first ideas over preliminary and detailed design to tendering, commissioning, site supervision and operation. Dr Rune Brandt is active in several PIARC tunnel working groups. Moreover, he serves on scientific committees in various countries. He holds a Ph.D. from Cambridge University (UK), is Eur Ing and has a M.Sc. from the Technical University of Denmark.

09:35

Opening Keynote Address
Professor Arnold Dix, ALARP, Australia

Professor Dix is president of ITA. He is a specialist legal/technical adviser in all aspects of tunnel risk. Investigating real disasters as the government's investigator, formulating project contracts, resolving disputes and adjudicating conflicts.

A barrister of 30+ year's experience and scientist – visiting Prof Engineering, CEO Alarp group of companies, Executive Vice President ITA, committees of NFPA 130 & 502, member International Tunnel Insurance Group and former PIARC committee and WG member.

Presenting; Sustainability in Underground Construction – Enabling for the Future

SESSION 1 – SUSTAINABILITY IN UNDERGROUND DESIGN AND CONSTRUCTION
Chairman: Dr. Rune Brandt, HBI Haerter AG, Switzerland

10:15 **Driverless metro line TVS scheme optimization with an energy saving and CO2 minimization concept**
G. Leoutsakos, Elliniko Metro SA, Greece; P. Molteni, M. Mossi, GESTE Engineering SA, Switzerland

10:35 **Innovative tunnel ventilation solution for Chennai Metro, India- a case study**
R. Singh, S. Vassoudevane, Systra, U.A.E.; H. Prasad, Chennai Metro, India

10:55 **Tunnel ventilation system design with longitudinal and transverse system for upcoming metro line in Singapore**
G. Louis, J. Chua, L. F. Cai, E. Poon, H. Wijaya, M. Thong, Land Transport Authority, Singapore

11:15	Exhibitors Presentation	Zitrón	11:30	Exhibitors Presentation	Halton
11:20	Exhibitors Presentation	ARUP	11:35	Exhibitors Presentation	UES tunnelsafety.at
11:25	Exhibitors Presentation	SOHATSU	11:40	Exhibitors Presentation	Howden

11:45 – 13:00 Lunch break – sponsored by Howden

SESSION 2A: ROAD TUNNEL CASE STUDIES
Chairman: Antoine Mos, Centre of Expertise on Tunnels, France

SESSION 2B: RAILWAY CASE STUDIES
Chariman: Dr. Pierre Carlotti, Artelia, France

Sealing the deal: Managing leakage in pressurized egress corridors for tunnels
K. Lopez, A. Ibraheem, D. Hahm, N. Harvey, Mott MacDonald, USA

13:00 **Simulation of air temperatures in rail tunnel network of Stuttgart 21 to assess risks of frost in fire-fighting water pipes**
E. Doehler, P. Reinke, HBI Haerter AG, Switzerland

Tunnel ventilation solutions in unconventional road tunnel designs
M. Asim, Y. S. Ting, Jacobs Solutions, United Arab Emirates; R. Zupu, Jacobs Solutions, UK

13:20 **Partial lid and portal enclosed station design strategies**
S. Cassady, H. Raharja, E. Jones, S. Parayil, HNTB Corporation, USA

Designing the tunnel ventilation system for the world's most complex road tunnel; The Rozelle Interchange
D. Fernandes, D. Saunsbury, WSP, Australia

13:40 **Installation of platform smoke exhaust to the three 40-year-old Melbourne Underground Rail Loop stations**
L. Henderson, A. Eltouny, F. Liberty, S. Maheshwari, R. Chan, Metro Trains Melbourne, Australia

Methodology to develop ventilation alternatives to improve existing transverse ventilation using field measurements for model calibration
A. Page, Y. Li, R. Faddoul, I. Maevski, S. Nair, T. O'Dwyer, Jacobs, USA

14:00

14:20 – 15:00 Refreshment break

SESSION 3A: SMOKE MANAGEMENT AND EGRESS (TENABILITY)
Chairman: Dr. Miho Seike, Hiroshima University, Japan

SESSION 3B: INNOVATIONS IN VENTILATION DESIGN AND CONTROL
Chairman: Sean Cassady, HNTB, USA

Analysis of radiation in the region of a train fire in an open station
N. Rhodes, Consulting Engineer, USA; I. Khalil Mbaye, Parsons, USA; R. Dillman, Amtrak, USA

15:00 **CFD investigation of the improvement of smoke control in a tunnel equipped with a longitudinal and a transverse ventilation system**
G. Remion, A. Mos, Center for Tunnel Studies (CETU), France; P. Salizzoni, M. Marro, S. Lanzini, Laboratoire de Mécanique des Fluides et Acoustique (LMFA), France

Advanced technologies for a safe evacuation at the underground rescue point of the railway Koralm Tunnel
F. Diernhofer, ILF Consulting Engineers Austria GmbH, Austria; H. Steiner, ÖBB-Infrastruktur AG, Austrian Federal Railways, Austria; M. Bacher, Graz University of Technology, Austria

15:20 **Smoke detection in branching tunnels**
M. Ehrensperger, V. Butty, S. Frey, HBI Haerter AG, Switzerland

Optimised station design via coupled CFD-evacuation modelling
M. Tabarra, N. Dawda, Arup, UK

15:40 **Retrofitting variable flow axial fan by inverter control at the Kan-etsu Tunnel**
M. Akaishi, East Nippon Expressway Co., Ltd, Japan; K. Hoshi, H. Sako, NEXCO Engineering Niigata Co., Ltd., Japan; T. Sakaguchi, Sohatsu Systems Laboratory Inc., Japan; A. E. Vardy, University of Dundee, UK

Decarbonization of ventilation facilities for overbuilds
A. Louie, S. Li, S. Marsico, E. Fuster, WSP USA

16:00

Risk assessment to establish separation distance of cross passages for fire emergencies in road tunnels constructed with large diameter tunnel boring machines
P. Sabapathy, Aurecon, Australia; M. Strasser, S. Soylu, AECOM, Australia

16:20

16:40 – 16:45 Stretch break to plenary

SESSION 4: TESTING AND COMMISSIONING
Chairman: Dr. Mohammad Tabarra, Arup, UK

16:45 **Cold smoke test in an iconic station**
M. Fronterré, P. d'Angella, Cantene s.r.l., Italy; J. Rodler, Forschungsgesellschaft, Austria; A, Hertel, ArRiyadh New Mobility, Saudi Arabia

17:05 **Flow Measurement for Tunnel Ventilation**
P. Pospisil, B. Hagenah, D. Johnson, HNTB Corporation, USA

17:25 **Exhibitors Presentation** PROMATION ENGINEERING

17:30 **Exhibitors Presentation** rotork

17:35 **Exhibitors Presentation** CODEL A Forbes Marshall Company

17:40 **Exhibitors Presentation** SODECA

17: Welcome reception – sponsored by SODECA

Tuesday 29th October 2024

08:30

Keynote Address
Dr. Severin Wälchli, NAGRA, Switzerland

Dr. Wälchli is the head of Planning and Construction and member of the executive board of Nagra – National Cooperative for the Disposal of Radioactive Waste in Switzerland.

Presenting; Swiss Deep Geological Repository – a Century Project

nagra.

SESSION 5: SMOKE CONTROL AND CRITICAL VELOCITY
Chairman: Conrad Stacey, Stacey Agnew, Australia

09:10 **A one-dimensional critical velocity wholistic formulation based on conservation laws, combustion, and convective and radiative fire heat release**
J. Greg Sanchez, TYLin International, USA

09:30 **Investigating "bifurcation flow" in tunnel fire scenarios**
J. Sowrirajan, M10 Fire Consultancy, University of Edinburgh, UK; R. Carvel, University of Edinburgh, UK

09:50 **Efficiency of a smoke screen in a longitudinally ventilated tunnel**
A. Narcisse, O. Vauquelin, E. Casalé, Aix-Marseille Université, France; R. Nottet, FluidAlp, France

10:10	Exhibitors Presentation	VID FIREKILL	10:25	Exhibitors Presentation	vipo
10:15	Exhibitors Presentation	FOGTEC FIRE PROTECTION	10:30	Exhibitors Presentation	egis
10:20	Exhibitors Presentation	Danfoss Fire Safety	10:35	Exhibitors Presentation	ARTELIA

10:40 – 11:20 Refreshment break sponsored by ARTELIA

SESSION 6A: CFD/1-D MODELLING
Chairman: Norman Rhodes, Consulting Engineer, USA

Comparison of CFD and 1D models for prediction of the drag coefficient of a train moving through a tunnel
S. Alipour, R. Kamali, Shiraz University, Iran; S. Sadrizadeh, KTH Royal Institute of Technology, Mälardalens University, Sweden; O. Abouali, E. Östblom, P. Sahlin, EQUA Simulation AB, Sweden

CFD modelling of urban road tunnels: towards accurate parameter estimation
M. Demuynck, S. Denys, University of Antwerp, Belgium

Numerical investigation of flow resistance of fires in road tunnels
R. Deb, A. Weber, Ostschweizer Fachhochschule, Switzerland; I. Riess, Riess Ingenieur-GmbH, Switzerland

Improvement of ventilation plants for smoke removal in metro networks using CFD
P. Carlotti, Artelia, France; H. M. Andjibou, CEA, France; S. Grandi, Artelia, France

Analysing the significance of turbulence models in predicting the installation efficiency of jet fans in tunnels: A comprehensive investigation
R. Khodadadi, T. Abbas, P. Scriven, HDR, UK; T. Waldron, HDR, USA

SESSION 6B: EQUIPMENT
Chairman: Ian Sweetland, Yyss Ltd., UK

11:20 **Evaluation of filter service life in a rail tunnel application**
D.Fruhwirt, M. Bacher, Graz University of Technology Austria; H. Steiner, Austrian Federal Railways, Austria

11:40 **Advancements in tunnel ventilation: a comprehensive exploration of spring return and non-spring return actuators from planning to commissioning**
T. Doebeli, ProMation Engineering AG, Switzerland; D. J. Geraci, ProMation Engineering Inc., USA

12:00 **Assessment on the use of stall-free axial fans in underground ventilation systems**
J. Teoh, Kruger Ventilation Industries Asia Co. Ltd., Thailand; J. Suarez, Soler & Palau Ventilation Group, Spain; T. Puntawuttiwong, Kruger Ventilation Industries Asia Co. Ltd., Thailand

12:20 **Evaluating standards and specifications for tunnel dampers and a call for international consistency**
R. Bos, FlowPro, Thailand

12:40

12:40 – 13:50 Lunch break – sponsored by VID FIREKILL

SESSION 7A: ROAD TUNNEL REFURBISHMENTS
Chairman: Igor Maevski, Jacobs Engineering, USA

Investigation of a temporary tunnel ventilation during construction phase in bidirectional traffic
M. Weithaler, R. Gertl, B. Chystyakov, S. Dabiri, ILF Consulting Engineers Austria GmbH, Austria

SESSION 7B: HIGH SPEED RAIL TUNNELS AND HYPERLOOP SYSTEMS
Chairman: Dr. Fathi Tarada, Mosen, UK

13:50 **Estimating maximum pressure gradients of compression waves in slab track tunnels**
T. Miyachi, Railway Technical Research Institute; M. Ohnawa, Tokyo University of Marine Science and Technology, Japan

Replacement of the ventilation system in the Fréjus Tunnel, France-Italy
J. Mathelon, R. Debacque, M. Genthon, setec tpi, France

An efficient Refurbishment of the longitudinal ventilation system in the Mont Blanc tunnel
A. Host, Egis Tunnels, France; G. Planchenault, Eiffage Energie Systèmes, France; F. Waymel, Egis Tunnels, France; B. Houseaux, Eiffage Energie Systèmes, France

Louis-Hippolyte La Fontaine tunnel ventilation system upgrade
A. Golpaygan, G. Delque, H. Hosseinimanesh, J. Habimana, Hatch, Canada; N. Rhodes, Consulting Engineer, U.S.A.; *F. Munteanu, Ministry of Transportation Quebec, Canada*

Impact of airport tunnel ventilation on airfield operation
A. Page, I. Maevski, Jacobs, USA

A study on predicting the pressure rise in secondary spaces due to high-speed train movements
E. Hataysal, T. Kin Lam, COWI, UK; R. Khodadadi, HDR, UK

14:30 **Calibrating aerodynamic software for simulations of flows in Hyperloop-like systems**
A. E. Vardy, University of Dundee, UK; J. Nicolau, Technical University of Munich, Germany

14:50

15:10

15:30 – 16:10 Refreshment break + sponsored by ARTELIA

SESSION 8A: EQUIPMENT Part 2
Chairman: Ian Sweetland, Yyss Ltd., UK

A study how to specify Jet Fan's performance for road tunnel ventilation
Y. Akaza, W. Takahashi, M. Hayakawa, A. Ichikawa, Nippon Expressway Research Institute Ltd, Japan

A comprehensive verification methodology for jet fan tunnel ventilation applications
S. Alizadeh, Mott MacDonald Ltd, UK

Innovations in electric motors for heat and smoke extraction: Adherence to standards, precision manufacturing and environmental compatibility
C. A. Cezario, C. C. Bombazar, F. Zanella, L. Z. Barboza, R. G. Andrzejewski, R. S. Barbetta, R. F. Fernandes, T. Voigt, W. L. Pires, WEG Industrial Motors, Brazil

SESSION 8B: PLATFOPRM SCREEN DOORS
Chairman: Prof. Alan Vardy, University of Dundee, UK

16:10 **Do full-height platform screen doors really improve safety?**
P. Dorado, ARTELIA, Aix-Marseille Université, France; P. Carlotti, ARTELIA, France; O. Vauquelin, Aix-Marseille Université, France

16:30 **Impacts of PSDs on smoke dispersion in aboveground elevated stations**
M. Del Gobbo, S. Fiedler, C. Li, Hatch Ltd., Canada

16:50 **TVS and VAC interface in arid climate regions metro project**
A. Abdelmajed, Qatar Rail, Qatar; I. Khalil Mbaye, Parsons, Qatar; A. Benzamia, Qatar Rail, Qatar

17:10 – 17:15 Stretch break to plenary

17:15

DISCUSSION

Who should decide design fires in tunnel projects: Client, Consultant, International Guidelines, Other?

Discussion panel:	Focus area
Rune Brandt (Chairman)	Road-tunnel guidelines
Mohammad Tabarra	Rail-tunnel guidelines
Arnold Dix	Legal matters / consequences
Kim Smedegaard	Client perspective road and rail tunnel

17:55	Exhibitors Presentation	S&P KRUGER Underground Ventilation Division	18:05	Exhibitors Presentation	HBI
18:00	Exhibitors Presentation	F2A Manufacturer Air handling components	18:10	Exhibitors Presentation	wsp

19:30 **Symposium dinner at the Tivoli Hotel - sponsored by** wsp

Best paper award - sponsored by HBI

Wednesday 30th October 2024

SESSION 9: DIGITALISATION
Chairman: Natasha De los Rios, Mott Macdonald, USA

08:30 **Use of 1D network simulations of road tunnel ventilation for operational decision-making**
M. D. Griffith, F. Michelin, Howden Ventsim, Australia; M. Kost, Transurban, Australia

08:50 **Application of digitisation in the commissioning phase of tunnel ventilation system using a selected example**
M. Borowski, K. Zwolińska-Glądys, K. Piech, A. Szmuk, AGH University of Krakow, Poland

09:10 **On digitalisation for tunnel-ventilation design, procurement, installation, commissioning, and maintenance**
R. Brandt, S. Frey, J. Funnemark , S. Thumm, HBI Haerter, Switzerland

09:30	Exhibitors Presentation	Jacobs	09:45	Exhibitors Presentation	MOJET
09:35	Exhibitors Presentation	COWI	09:50	Exhibitors Presentation	MOSEN
09:40	Exhibitors Presentation	MOTT MACDONALD			

09:55 – 10:35 **Refreshment break**

SESSION 10: NEW ENERGY CARRIERS
Chairman: Kate Hunt, WSP, UK

10:35 **Impact of fixed firefighting system and emergency ventilation system on battery electric bus fire in road tunnels**
H. Raza, S. Li, A. Louie, WSP USA

10:55 **Fire and explosion risks of new energy carrier vehicles in tunnels: latest findings and concepts for tunnel risk assessment framework implementation**
O. Heger, R. Schmidt, ILF Consulting Engineers Austria GmbH, Austria; P. Foessleitner, D. Fruhwirt, Graz University of Technology, Austria

11:15

Sir Alan Muir Wood Prestige Lecture

Kim Smedegaard Andersen,
Femern AS / Sund & Bælt Partner, Denmark

Sponsored by: MOSEN

Femern Sund & Bælt

Kim Smedegaard Andersen is Deputy Technical Director of Femern AS and CEO for Sund & Bælt Partner A/S since 2013. From 2020 he has been Chairman of the Danish Tunnelling and Underground Society, and a member of ITA. He is also an advisor to OECD on Risk Allocation within infrastructure projects

Presenting; Fehmarnbelt tunnel – the green corridor

12:15 – 13:25 **Lunch break – sponsored by** Jacobs

SESSION 11: DESIGN METHODS USING ARTIFICIAL INTELLIGENCE AND OR MACHINE LEARNING
Chairman: Prof. Arnold Dix, Alarp, Australia

13:25 **Integrating fire modelling and machine learning techniques to predict the probability of life safety in naturally ventilated road tunnels**
I. Obadi, G. Hadjisophocleous, Carleton University, Canada

13:45 **Optimal layout for a road tunnel ventilation system**
S. Karami, WSP, Australia

14:05 **Extending the life of tunnel ventilation equipment using AI health monitoring**
S. Shah, M. Tabarra, Arup, UK

14:25 **Control of the tunnel ventilation system of a road tunnel using artificial intelligence**
G. Koc, J. Davidson, M. Shah, WSP, Australia

CHAIRMAN'S CLOSE OF SYMPOSIUM

14:45 **Chairman - Dr. Rune Brandt, HBI Haerter AG, Switzerland**
Deputy Chairman - Professor Arnold Dix, Alarp, Australia

15:05 – 15:35 **Farewell refreshments**

Thursday 31st October 2024

09:30

Copenhagen Metro Site Visit

Departure from Tivoli Hotel 09:30

- Guided tour of the Metro Control Centre
- Explore the Havneholmen Ventilation Shaft
- Experience the M4 line with a return journey from Havneholmen to Copenhagen South
- A scenic walk back to Tivoli Hotel

The fee is £38.75 GBP and includes a return ticket from Havneholmen to Copenhagen South

Meet your Session Chairs

SESSION 1 – Sustainability in Underground Design and Construction
Chairman: Dr. Rune Brandt, HBI Haerter AG, Switzerland

Dr Rune Brandt heads the renowned and internationally reputed consultancy HBI Haerter. Since 1963, the tunnel ventilation and the safety concept of more than 1000 tunnels worldwide have been designed by HBI Haerter that has offices in Switzerland, Germany and Australia. Moreover, pollutions dispersion modelling and risk assessment is part of the core services. HBI Haerter follows projects during their entire evolution from first ideas over preliminary and detailed design to tendering, commissioning, site supervision and operation. Dr Rune Brandt is active in several PIARC tunnel working groups. Moreover, he serves on scientific committees in various countries. He holds a Ph.D. from Cambridge University (UK), is Eur Ing and has a M.Sc. from the Technical University of Denmark.

SESSION 2A: Road Tunnel Case Studies
Chairman: Dr. Antoine Mos,

I have been working at CETU, the technical body of the French Ministry of Transportation dedicated to tunnels, for 20 years. I started as a PhD student, then research engineer and deputy head of department. My work includes applied research on fire modelling and smoke control optimisation, as well as engineering and consulting on various road, rail or metro tunnel projects, both new and existing.

I have been a member of ventilation-related PIARC working groups since 2009 (currently WG4 on new energy carriers).

SESSION 2B: RAILWAY CASE STUDIES
Chariman: Dr. Pierre Carlotti, ARTELIA, France

Pierre graduated from Ecole Polytechnique (Paris); PhD University of Cambridge; Has worked on fire safety and ventilation in road and rail tunnel for 20 years. Former head of Laboratoire Central de la Préfecture de Police, where he worked, among other subjects, on post fire investigation and fire risk in Paris train and metro network. Currently works on Grand Paris Express, Toulouse Metro line C, and several other projects, while carrying on research on fire science.

SESSION 3A: SMOKE MANAGEMENT AND EGRESS (TENABILITY)
Chairman: Dr. Miho Seike, Hiroshima University, Japan

Miho Seike is associate professor of Hiroshima University, having received her Ph. D in 2015. Her major is fluid engineering and safety engineering. Her recent research work is to investigate evacuation behaviour by full-scale tunnel with smoke experiments. She is also interested in rescue and fire-fighting activities in smoke filled large enclosed space such as tunnels and undergrounds space fire. She focuses on the bahaviour of smoke and evacuees in tunnel fires by full-scale experiments and numerical simulations. She is a Membership Advisory Council (MAC) member of International Association for Fire Safety Science (IAFSS) since 2023 and also Co-Chair of the Diversity, Equity, Inclusion.

SESSION 3B: INNOVATIONS IN VENTILATION DESIGN AND CONTROL
Chairman: Sean Cassady, HNTB, USA

Sean has more than 29 years of experience in mechanical engineering analysis and design, with the last 18 years focused on pollutant management and fire hazard mitigation within enclosed vehicular transit and highway facilities. He is a registered professional engineer in fire protection and mechanical engineering disciplines with a degree in mechanical engineering from the University of Washington. Sean has lead teams in fire hazard mitigation system design and analysis on a variety of projects including;

- 17.5 m dia., 2.7 km long SR99 bore tunnel in Seattle
- 13.2 m dia., 3.4 km long Bosporus straight crossing tunnel in Istanbul
- Renovation/retrofit of stations and tunnels on various transit and highway projects for capacity increase, flood mitigation or infrastructure hardening measures

HNTB

SESSION 4: TESTING AND COMMISSIONING
Chairman: Dr. Mohammad Tabarra, Arup, UK

Mohammad is Arup's global lead on tunnel ventilation business, advising clients contractors and operators on industrial ventilation projects, as well as solar energy masterplans. With 40 years of consulting and management experience, he specialises in tunnel and metro ventilation, aerodynamics, computational fluid dynamics (CFD) and solar energy. He has led the design and technical management of many of Arup's successful tunnel and metro projects and has lectured extensively to future engineers. Mohammad is a Fellow of the Institute of Mechanical Engineers (IMechE) and member of ASHRAE TC5.9, reviewing and contributing to several papers.

He works closely with clients, applying R&D and linking academics to contractors to deliver sustainable tunnel and metro solutions to help shape a greener world.

ARUP

SESSION 5: SMOKE CONTROL AND CRITICAL VELOCITY
Chairman: Conrad Stacey, Stacey Agnew, Australia

Mechanical engineer with an early background in mining, hypersonic upper atmospheric flight, scramjet propulsion, open channel hydraulics, livestock heat stress on ships, the geodynamo and boomerang aerodynamics.

Now a thought leader in ventilation and fire safety in underground infrastructure.
Current projects are
Atlanta Plane Train Extension
Brisbane Cross River Rail
Brisbane Metro Busway
Sydney WestConnex Motorway Tunnel network
North East Link road tunnel in Melbourne

Stacey Agnew

SESSION 6A: CFD/1-D MODELLING
Chairman: Norman Rhodes, Consulting Engineer, USA

Norman played a key role in the development and application of the first general-purpose CFD codes, which included pioneering three-dimensional fire and smoke movement models—now widely used and accepted in design practices. At Mott MacDonald, he led the simulation and modeling division, contributing to major infrastructure projects, particularly in tunnel ventilation and safety. During this time, he also researched the use of Virtual Reality for design visualization, integrating simulation results to illustrate operational strategies. This work led to the development of the pedestrian modeling software STEPS.

Norman is a former chair of the IMechE Thermofluids Committee and served as secretary of PIARC's working group on Fire and Smoke Control in Tunnels, where he contributed to PIARC's monographs on tunnel fire safety. Additionally, he was a member of the steering committee for the European Union's Fires in Tunnels (FIT) thematic network and served as rapporteur for the FIT report on fire response management.

SESSION 6B and SESSION 8A: EQUIPMENT
Chairman: Ian Sweetland, Yyss Ltd., UK

Ian is a Mining Engineer who gave up digging coal, in darkness, in order to design, construct, deliver and measure the mechanical systems that blow air through the same holes. Complicated by usually being too warm, sometimes too cold, occasionally gas laden etc. and still in darkness. He “saw the light” – thanks to Arthur Scargill and the miners strike in 1984 – and moved from working in the dark to a, generally, daylight environment, and continued designing, constructing, delivering and measuring, whilst at the same time changing from “complicated networks of mine airways” and high pressures to “long tubes” and low pressure in tunnels. Currently building petrol powered fans AKA aircraft.

Yyss

SESSION 7A: ROAD TUNNEL REFURBISHMENTS
Chairman: Igor Maevski, Jacobs Engineering, USA

- Chairman of ASHRAE TC TC5.9 on Enclosed Vehicular Facilities (2014 – 2016);
- Chairman of ASHRAE Standard Committee SPC 217 “Non-Emergency Ventilation in Enclosed Road, Rail and Mass Transit Facilities”;
- Principal Member of NFPA 502 Technical Committee since 2004;
- Author of the Transportation Research Board (TRB) Synthesis Study – Design Fires in Road Tunnels – a detailed description of national and international design and operation practices;
- Author of Recommended AASHTO Guidelines for Emergency Ventilation Smoke Control in Road Tunnels;
- Professional Engineer in the States of New York, New Jersey, Washington.
- Over 30 years of experience in tunnel ventilation and fire life safety systems design and analysis

Jacobs

SESSION 7B: HIGH SPEED RAIL TUNNELS AND HYPERLOOP SYSTEMS
Chairman: Dr Fathi Tarada, Mosen, UK

Fathi is the founder and managing director of Mosen Ltd, an engineering consultancy. He is qualified in engineering, management and
law and is a leading expert in fire safety engineering, tunnel ventilation and Computational Fluid Dynamics. Fathi is the inventor of the MoJet® ventilation system, a patented energy-efficient device that has been installed in tunnels worldwide. He represents the United Kingdom at the Technical Committee on Road Tunnel Operations for the World Road Association (PIARC), and was awarded a medal for Construction Health & Safety by the Institution of Civil Engineers.

MOSEN

SESSION 8B: PLATFOPRM SCREEN DOORS
Chairman: Prof. Alan Vardy, University of Dundee, UK

Author and supplier of the tunnel airflow software ThermoTun (rail), inventor and lead developer of tunnel control software MPVC (road)
Advisor in tunnel aerodynamics, ventilation and control
Research interests:

- Transient flows in networks
- Micro pressure wave assessment and suppression
- Pipeline condition monitoring
- Micro-scale modelling of turbulent wall boundary layers
- Practical numerical analysis
- Related interests:
- Safe tunnel operation
- Responsible uses of the world’s resources

University of Dundee

SESSION 9: NEW ENERGY CARRIERS
Chairman: Kate Hunt, WSP, UK

Kate leads WSP's Tunnel Systems team in the UK. She has substantial experience in the engineering design and analysis of ventilation systems for road, rail/metro and cable tunnels and a deep appreciation of fire life safety systems and the wider tunnel M&E installations for these applications. Kate's substantial breadth of experience in tunnel systems and operations allows her to develop robust operating strategies and bring a holistic approach to tunnel systems design on many projects. Kate is also a UK Committee Member of PIARC's Tunnels committee.

SESSION 10: DIGITALISATION
Chairman: Natasha De los Rios, Mott Macdonald, USA

Natasha has over 25 years engineering experience with focus in design, analysis and technical review for underground ventilation and fire life safety for transit, rail, and road tunnel projects in the USA and abroad. Skilled in the application of industry-recognized analytical tools, such as: Subway Environment Simulation (SES), Computational Fluid Dynamics (CFD), and Egress Modeling software.

SESSION 11: DESIGN METHODS USING ARTIFICIAL INTELLIGENCE AND OR MACHINE LEARNING
Chairman: Prof. Arnold Dix, Alarp, Australia

Professor Dix is president of ITA. He is a specialist legal/technical adviser in all aspects of tunnel risk. Investigating real disasters as the governments' investigator, formulating project contracts, resolving disputes and adjudicating conflicts.

A barrister of 30+ year's experience and scientist – visiting Prof Engineering, CEO Alarp group of companies, Executive Vice President ITA, committees of NFPA 130 & 502, member International Tunnel Insurance Group and former PIARC committee and WG member.