



1791 Tullie Circle, N.E. / Atlanta, GA 30329  
404-636-8400

**TC/TG/TRG MEETING MINUTES**

**TC/TG/TRG NO. (TITLE):** TC 5.9 Enclosed Vehicular Facilities  
**DATE/TIME OF MEETINGS:** January 26, 2021 3 PM- 5 PM EDT  
**LOCATION:** Microsoft Teams online meeting

1. The Chair, David Newman, called the meeting to order at approximately 3 pm ET.
2. Identification of Voting Members. There were 7 of 9 voting members present, which met requirements for a quorum.

David Newman – Chair  
David Hahm – Programs S/C Chair  
Dimitry Kogan  
Bill Lampkin  
Tom O'Dwyer

Yoon Ko – Programs S/C Chair  
Andrew Louie – Handbook S/C Chair  
Duncan Phylfe  
James McCarron

3. ASHRAE Code of Conduct reviewed.
4. Approval of Minutes at last meeting – June 26, 2020 Virtual meeting. motion/second (approved)
5. Chairman's Remarks – David Newman
  - 5.1. David's first meeting as Chair
  - 5.2. Functional group evaluation completed with attendee response
  - 5.3. Rethinking meeting structure for the January and June meetings;
  - 5.4. Virtual meetings do have benefits – broader attendance than in-person meetings, newer members may have better opportunity to join
6. Kevin Marple, new Section Head remarks
  - 6.1. ASHRAE encouraging S/C to meet more than just the main meetings
7. Subcommittee Reports
  - 7.1. Programs Subcommittee (Yoon Ko) – see attached for sub-committee report
    - 2 sessions planned for Virtual (Chicago) conference
  - Standards Subcommittee (Igor Maevski for Yuan Li)
    - SPC 217 met January 29 with attendance of 20
    - Next meeting scheduled for April/May
  - 7.2. Handbook Subcommittee (Andrew Louie)
    - No new activity since last meeting
    - Next update is the 2024 HVAC Applications Handbook
    - Updates needed for support SPC 217
    - May need restructuring to update and add new content

7.3. Research Subcommittee (David Hahm) – see attached for subcommittee report

7.4. Webmaster (David Newman for Simona Tsvetkova)

- Will be looking to add more content on Basecamp

8. Liaison Reports

- TC 5.1 (Asesh Raychaudhuri) – TC 5.1 requesting co-sponsorship for program in Phoenix in June
- TC 5.6 (Yoon Ko) – lecture series planned for ASHRAE conference
- NFPA 130 (Andrew Louie) – no update; upcoming edition (2023) open for public comment until May 11
- NFPA 502 (Igor Maevski)
  - upcoming edition (2023) open for public comment until May 11
- PIARC (Ahmed Kashef) – adding content on Covid design for ventilation – tunnel, structures; also alternative fuels
- Mining (Jane Miller) – The North American Mine Ventilation Symposium will be held online this year; dates are June 12-17 – visit <http://namvs2021.org> for more information.

9. New Business and Comments

9.1. (David Newman) will be adding monthly S/C meeting – rotating between Programs, Handbook, Research and Standards; this should help to move work forward through the year, and not just at the Winter and Annual Conference meeting

- Meetings now scheduled for 4<sup>th</sup> Tuesday of the month starting February 23 3:00 pm – 4:00 pm EST
  - February – Programs
  - March – Handbook
  - April – Research
  - May – Standards
- (Greg Sanchez) suggested adding a new topic – Sound, should cover how to measure, acceptance criteria; should start with review of what's in our handbook chapter

10. Next meeting scheduled for Phoenix, AZ in June; it was announced February 16 that the Phoenix conference will be virtual

11. Meeting Adjournment – motion by Dimitry; second by Duncan

12. Submitted by Jane Miller, Secretary – TC 5.9

Attachments:

- Program S/C report
- Handbook schedule for 2024 HVAC Applications edition
- Research topics
- Attendance

# TC5.9 PROGRAM SUB-COMMITTEE REPORT

## Virtual Meeting – Winter 2021

### 1. programs for the current (Chicago) Virtual Meeting Programs:

- Conference Paper Session 16 (Intermediate) Air Mixing, Energy Recovery, Duct Sizing, Fire Propagation in Railcars, Track: Systems and Equipment  
**Fire Propagation in Rail Environments (VC-21-C041) Xinhe (Lily) Liu**, Emil Persson and Matthew Bilson, (1)WSP USA, New York, NY, (2)WSP, United States of America  
Live Q&A - Air Mixing, Energy Recovery, Duct Sizing, Fire Propagation in Railcars: Descriptions, Analyses and Solutions Friday, February 12 11:00 AM – 11:20 AM EST Zoom
- Conference Paper Session 20 (Intermediate) Handling Environmental Effects on Ventilation Systems, Track: Environmental Health Through IEQ  
**Fire Detection and Ventilation Response in Rail Tunnels (VC-21-C050) Andre Calado**, Member, Jacobs Engineering, New York, NY  
Live Q&A - Handling Environmental Effects on Ventilation Systems  
Friday, 12 February 11:40 AM – 12:00 PM Zoom
- Seminar 67 (Basic) Life Safety Dampers, Back to Basics, Track: Systems and Equipment  
Sponsor: 5.6 Control of Fire and Smoke

### 2. Future conferences

	Conference paper abstract due	Seminar, Forum proposal due
Phoenix, AZ, Jun 2021		<b>Monday February 22, 2021</b>
Las Vegas NV, Jan 2022		
Toronto, ON, Jun 2022		
Atlanta, Georgia, Feb. 2023		
Tampa Bay, Jun 2023		

Debate

1 moderator, 60-90 min, 3-4 panelist, in individual presentations

Forum

1 moderator, 60 minutes, no presentations

Panel

1 moderator, 60-90 minutes, 3-6 participants, no individual presentations

Seminar

2-3 speakers for 60 min or 3-5 speakers for 90 min

Workshop

One chair and two presenters (maximum), 60 min long including 30 min presentation and 30 min discussion

- **Phoenix Annual Meeting, June 2021**

Tracks;

- ✓ Fundamentals and Applications. Track Chair Sonya Pouncy, sonyapouncy@gmail.com
- ✓ HVAC & Systems and Equipment. Track Chair. Rupesh Iyengar, upesh\_iyengar@yahoo.com
- ✓ Research Summit. Track Chair. Kristen Cetin, cetinkri@msu.edu
- ✓ Professional Development. Track Chair. Marites Calad, mcalad@norman-wright.com

- ✓ Design, Control, and Operation of Critical Environments. Track Chair. Raul Simonetti, raul.simonetti@carel.com
- ✓ HVAC&R for Indoor Plants & Animals. Track Chair. Ryan MacGillivray, ryan.macgillivray@dwel.com
- ✓ Future Proofing Renewable, Regenerative, and Resilient. Track Chair. Andy Cochrane, acochrane@industrialairinc.com
- ✓ Hot Hot Hot, the world is warming. Track Chair. Nohad Boudani, nohadb@inco.com.lb
- ✓ Mini track. To be announced.
- ➔ Potential FORUM PROPOSAL on Covid issues of HVAC systems of transportation facilities (Yoon to follow with Duncan, Elias, Dimitry, Bernd, Jesse)
- ➔ Potential SEMINAR PROPSAL with min. 2 speakers (Yoon to follow with Steve, Bob, Thomas, Greg)
  - The influence of IoT over ventilation control of enclosed spaces (Steve)
  - Wireless control to improve ventilation performance (Steve)
  - Revising Bob's paper on Jet fan control optimization (Bob)
  - Best practices for Enclosed Vehicular Facilities ( Thomas)
  - Air curtain (Greg)

Next: Las Vegas NW, Winter Meeting Jan 29-Feb2

No information available at the time the report was submitted. Will update as soon as is available.

### **Future Program Topics**

Can Wireless Control Improve Ventilation Performance (Champion: Steve Presser)

Air Cleaning for Tunnels (Champion: Igor Maevski)

Extreme Events Ventilation Requirements (Champion: Greg Sanchez)

Best Practices for Enclosed Vehicular Facilities (Champion: Tom O'Dwyer)

Tunnel Ventilation Velocity Profile on Egress Calculations (Champion: Ahmed Kashef)

Matrix Development to Achieve LEED Certification in Station Design (Champion: Mohammad Tabarra)

Platform Screen Doors (Champion: Greg Sanchez)

Natural Ventilation Applications in Enclosed Vehicular Facilities (Champion: Mark Colino)

BIM in Tunnel Ventilation Design (Champion: Igor Maevski)

Special Ventilation Issues in High-Speed Rail Tunnels (Champion: Ian Ong)

Boundary Conditions for Tunnel Ventilation Modeling (Champion: Tom O'Dwyer)

Ventilation Design for Road Tunnels Based on Risk Analyses (Champion: Ahmed Kashef)

Perspectives on Design-Build Projects (Champion: Mark Colino)

Rail, Road, and Mass Transit Ventilation "concepts" under extreme events - harmful gents, aerosols, bacteria and virus. (Greg Sanchez)

Considering the current events where harmful substances may be exposed to a large mass of people, either in a rail or road tunnel, or in a mass transit train station or a bus station while waiting for service or while using the service, it is within the scope of TC 5.9 to address issues where emergency ventilation to these extreme events may require a special sequence of operation and strategy. As such, TC 5.9 opens session where engineers, scientists, and owners are free to present their ideas that may have an impact or may benefit the general public, as well as the owners of the systems. Pros and cons of various technologies or concepts may be presented.

Implementation of secondary/supplemental devices to help the environmental control in rail stations, rail and road tunnels, and bus operations. (Greg Sanchez)

Quite often, a major system is focus on a major event and small pieces of the systems will need to rely on secondary/supplemental devices, such as air curtains, platform screen doors, jet fans. This session will invite engineers, scientists, owners, to present innovation, challenges, requirements, special conditions where any of these devices have been used, needs to be used, may be considered as an option pending certain modifications to meet requirements. Basic design principles, specific test and commissioning requirements, potential benefit to help safe energy and improve the environment for the patrons. On systems that platform screens doors may not be practical, would air curtains or jet fans be applicable? What the benefit of platform screen doors is and what to do to mitigate infiltration/exfiltration during the dwell time?

Assessment of tunnel and station way side pressure transient and the impact it has on exposed equipment - dampers, fan, jet fans, doors, signs. (Greg Sanchez)

When installing equipment in the proximity of the right of way of vehicles, the vehicle piston exerts a force 90 degrees from the traveling direction, which varies depending on the annual area, the vehicle frontal area, and vehicle velocity, and the tunnel wall finishes. This also plays a role on patrons standing near the edge of the platform while waiting for the arrival of a train, or mass transit vehicle. The session invites engineers, scientists, owners to present case studies, concepts, numerical analysis, experiments, or requirements to assess the impact this phenomenon may exert on the various pices of equipement, or even the patrons. This would help identify standards needs, design requirements, or potential further research.

## 2024 HVAC Applications


		2020			2021			2022			2023			2024		
		Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct
Review	Current HB received (June 1)	June 1														
	TC selects HB subcom and chair				Feb 1											
	Review current HB for changes				Jul 1											
Revise	Decide extent of and outline revisions				Jul 1											
	Seek and appoint reviser(s)							Feb 1								
	Revise chapter(s)										Feb 1					
Approve	Send revised chapter to TC for review										Jul 31					
	TC approves chapter										Jul 31					
	Send chapter to HBC liaison										Jul 31					
Edit & Produce	HQ sends chpt. proof to TC contact													Mar 15		
	HB sent to printer (April 1)													Apr 1		
	HB mailed (May 15)													M 15		

HBC = Society Handbook Committee

HB = Handbook volume

HQ = ASHRAE Headquarters editorial staff

Future Research Topics

	Research Project	Stage	Champion	6/25/2019	6/18/2020	01/26/2021
1	Thermal comfort requirements for metro and railway station platform areas for normal ventilation	Pre-RTAR	Tom O'Dwyer	Awaiting public comments for SPC 217 for input before proceeding	The standard will be published shortly and public comments have been addressed.	SPC 217 Standard has been published
2	Emergency ventilation for alternative fuel and driverless vehicles in a fire scenario in tunnels and parking garages	Pre-RTAR	Duncan Phyfe	FHWA is interested in the topic and is creating a committee. Possible co-sponsorship with FHWA, NFPA Research Foundation. Look at NFPA 2. Look for other paths for co-sponsorship. Focus on ASHRAE relevancy, i.e. vented fires. NRC Canada has been performing research in fire detection and fire fighting of alternative fuel vehicle fires.	PIARC is also looking into alternate propulsion - Peter Sturm – Opportunity for co-sponsorship  Norris Harvey and Ahmed Kashef are corresponding members for PIARC	NFPA 502 looking at this issue for the Annex  PIARC - Ahmed to reach out to Peter Sturm  Norris is a part of the alternative fuel vehicles working group – David to reach out  Co-sponsorship opportunities
3	Comprehensive tunnel ventilation systems inspection requirements for NTIS program.	Pre-RTAR	Igor Maevski	Enhancement of NTIS standard for inspection for mechanical and electrical aspects of tunnel ventilation system. Possibility of co-sponsorship from FHWA	Stephen Bartha from FHWA is involved in the tunnel inspection program and attended the meeting – opportunity for co-sponsorship. See meeting notes.	David to reach out to Stephen, see what type of co-sponsorship opportunities there are.
4	LEED requirement/certification for station design based on ASHRAE 90.1	Pre-RTAR	Matt Davy		Mohammad Tabarra original author of previous RTAR. Will work with Matt and Jarrod Alston to resurrect.	David to reach out to Matt to determine progress.
5	Review role of Phase 1 Integrated Design of EVS-FFFS in Highway Tunnels – Funding mechanism.	Post-award	David Hahm	Reach out to MORTS	Stephen Bartha is filling in the role of Bill Bergeson for FHWA and attended the meeting. Additional tasks have been awarded. FHWA looking to form review panel with one point of contact from TC 5.9. See meeting notes.	ASHRAE TC5.9 is on the technical review panel. Project is progressing, TC5.9 has provided comments for the draft test protocol, literature survey and synthesis, progress meeting, workshop report documents.
6	Phase 2 for Integrated Design of EVS-FFFS in Highway Tunnels	Pre-RTAR	Igor Maevski	Full scale fire tests – Memorial Tunnel		Dependent on first phase.
7	High Speed Pressure Transients	Pre-RTAR	Andrew Louie	Obtain PSD RTAR to determine if there is relevant information for pressure transients in high speed rail.	Previous RTAR is uploaded on Basecamp.	Consult with manufacturers for pressures suitable for equipment (signage, dampers, etc)
	<div>SPC 217 Groups – Topics can be developed for the Subgroups</div> <div><div>Topics for Further Development</div><div><ul style="list-style-type: none"><li>• Station Thermo Comfort</li><li>• Virus and Bacteria Protection of Stations</li><li>• High Speed Rail Aerodynamics and Ventilation</li><li>• Freight Tunnels Ventilation</li><li>• Alternative Fuel Vehicles Emissions / Ventilation<ul style="list-style-type: none"><li>• Road</li><li>• Rail</li></ul></li><li>• Hyperloop? Other Type of Tunnels?</li><li>• Assets Management</li></ul></div></div>					

David Newman	TC Voting Member
Andrew Louie	TC Voting Member
Dimitry Kogan	TC Voting Member
David Hahm	TC Voting Member
Duncan Phyfe	TC Voting Member
Yoon Ko	TC Voting Member
Bill Lampkin	TC Voting Member
Matt Davy	Corresponding Member
Jane Miller	Corresponding Member
Yuan Li	Corresponding Member
Igor Maevski	Corresponding Member
Andre Calado	Corresponding Memeber
Ahmed Kashef	Corresponding Member
Greg Sanchez	Corresponding Member
TJ Lyle	Corresponding Member
Baljinder Bassi	Corresponding Member
GS Pressor	Corresponding Member
Asesh Raychaudhuri	Corresponding Member
Nader Shahcheraghi	Corresponding Member
Robert Smith	Corresponding Member
Sean Cassidy	Corresponding Member
Justin Edenbaum	Provisional Corresponding Member
Olivia Volker	Provisional Corresponding Member
Blake Hughley	Provisional Corresponding Member
Natasha de los Rios	Guest
Elias Papadopoulos	Guest
Stephen Bartha	Guest
Linh Warren	Guest
Sai Doddi	Guest
Jacob Carr	guest
Jesse Harder	guest
Triet Tran	guest
Harris Raharja	guest
Evan Bycer	Guest