



ASHRAE Meeting Minutes (~~Draft~~)

TC 9.6 Health Care Facilities

Austin/Virtual Annual Meeting
Friday, June 19, 2020 1:00 to 3:00 PM EDT
Zoom Meeting

MEETING MINUTES

Meeting Minutes reported by Ken Mead, TC 9.6 Secretary

- 1) **TC called to order at 1:00 pm by Chair (TH)**
 - a) TH walked through agenda – changes for Virtual Introductions were made by attendees.
 - b) Agenda and Sign-in link shared to document attendance.
 - c) Roll call - members present confirmed: 12 of 15 quorum voting members present – quorum reached
 - d) Also present are 4 excom non-voting members.
 - e) Corresponding members present 48, including 20 noted as PCM
 - f) Guests present - 26
 - g) YEA members – 11
 - h) All Handouts, Agenda, Meeting Minutes (Draft and Final) Sign-in sheets (Appendix A), & subcommittee reports will be posted to the TC website: <http://tc96.ashraetcs.org>
- 2) **Chair's Report** – Traci Hanegan (TH)
 - a) Please see Chair's Slide Presentation and report from chair's breakfast (Appendix B)
- 3) **Minutes of Previous Meeting**– Ken Mead (KM)
 - a) Meeting Minutes from Orlando, FL have not been finalized. Supporting files are embargoed in TC Secretary's locked-down office (due to COVID-19) and will be drafted when TC secretary regains access to his files.
- 4) **Vice Chair Comments** – Nicolas Lemire (NL)
 - a) ML provided comment thanking committee members and participants for all the hard work in regards to TC and healthcare engineering response to COVID-19 as well as preparation for the virtual conference.
- 5) **Membership Chair Report**– Ron Westbrook (RW)
 - a) (also covered in chair's slide set)
 - b) 242 overall members (VM, CM, PCM)
 - c) 97 PCMs – up 44 since Orlando
 - d) 8 PCMs whose 2-yr term expires at end of June – 3 will be converted to CMs for sure, 5 will be re-evaluated for continuation based as participation
 - i) Ron described PCM-to-CM-to-VM process – how to contribute. Any record of participation over 2 yr PCM period gets you rolled over.
 - ii) RW shared ways to participate (listed subcommittees) – see slides
 - e) Roster changes – effective 08/01: Roll off Nick L, Tim E, roll on: Dylan Neu, Amit Bhansali
 - f) Reminded meeting attendees for process of how to join TC 9.6 – requires updated ASHRAE profile

- 6) Section 9 Liaison Report (Vance Payne)
 - a) Good attendance at TC 9 meetings
 - b) Make sure websites are updated to include updated past minutes etc...
 - c) ASHRAE also asked us to offer TC meetings at ashrae.net (Interim meetings, web conf, 1 week heads up) TCMeetings@ashrae.net. Also "TC Training" at ashrae.org website. Including presentation for local chapters.
 - d) ASHRAE also urging to look at other TCs for merge opportunities. – only 1 merger 9.4-9.8 has occurred – looking at statistics by TCs – documents, programs, etc...
 - e) TC 9 well attended subcommittees + covid resources very helpful – TAC appreciates, everyone appreciates (SH9@ashrae.net if questions)
- 7) **Sub-committee Reports (sign-ins for all subcommittee meetings are covered in the combined attendance report)**
 - a) Energy – David Eldridge (No meeting-no report)
 - b) Programs – Mark Tome (No subcommittee report in appendices)
 - i) Approx 35 people attended
 - ii) 2 prog this conf: (Sem 34, Sem 25)
 - iii) If you have program ideas, questions, or interest in subcommittee, email: mark.tome@alumni.psu.edu
 - c) Handbook – Pavel Likhonin (See minutes attached, Appendix C).
 - i) Approx. 43 people signed in. Lively discussion, 20+ tasks on list & 20+ volunteers.
 - ii) Additional interested volunteers, email Pavel at plikhonin@Dewberry.com
 - iii) Chapter will be voted on and sent to ASHRAE HdBK by May 2022
 - d) Research – David Thomsen (See minutes attached, Appendix D). Approx. 61 people signed in. Several (6) volunteers – reviewed recent research suggestions based off of research white paper by Rick Hermans, Infect aerosols PD. Topic covered included (but not limited to)
 - i) WS 1864 development
 - ii) IAQ assessments for post occupancy – mixing dilution discussion
 - iii) Bipolar Ionization and UV efficacy as possible research projects
 - iv) Action Items: Strategy prioritization
 - e) Infectious Diseases – Ken Mead (See minutes attached, Appendix E). Approx. 54 people signed in.
 - i) Discussed overviews of ASHRAE Infectious Aerosols PD
 - ii) Presentation: (K Mead) *The Control of Infectious Aerosols Using Air Exchange, Filtration and Source Control*
 - iii) Presentation: (Alejandro Falcon Bonilla): *Lessons Learned from MERS to Combat SARS-COV2 in UAE*
 - iv) Presentation: (Steve Freidman): moved to main TC meeting due to lack of time
 - v) Overview Discussion by Paul Supan- Dental Subcommittee – ASHRAE EPI Task Force
- 8) **Webmaster** – George Augustini
 - a) See webpage overview from TC Chair's slideset (Appendix B)
 - b) Website address is <http://tc096.ashraetcs.org>
- 9) **ALI** – Dan Koenigshofer & Pavel Likhonin
 - a) Course held yesterday 06-18-20 (approx 55 people, and in mid-April approx 250 people from ~20 countries)
 - b) Content updated for COVID and in order to make space for energy. New name: Hospital HVAC: Performance, comfort, Infection Control (250 2o countries – mid Apr, yesterday 55 people, ? countries)
 - c) Duration 1.5 hrs – included Don Burroughs talking about room design, ORs, Infectious isolation, ED, lots of surge capacity covid actions were discussed.
- 10) **Environmental Health** –Erica Stewart
 - a) Infectious aerosols position document released April 2020. Committee for update to this PD is reconvening early – new committee – coordinated from EHC – mix of representation
 - b) Epi Task Force – discussed later and in TC chair's slides
 - c) Erica congratulated – well-wishes for retirement
- 11) **Liaison Reports**
 - a) Std. 170 (Fauber) – combined spring meeting with FGI was cancelled, several conf calls now augmenting traditional meeting times.
 - i) June 10 call – 4 hr meeting, FGI presentation – emergency conditions white paper – expected end of summer

- ii) Presentation on filtration by Charlie S.
- iii) Kishor K Presentation: CFD study of ACH vs fixed cfm
- iv) Cmte seeking input re: pandemic and emergency conditions
- v) Upcoming July meeting- CMP reviews [Michel S. – S170 has approved or processed several new addenda so look to see them].
- b) Std. 189.3 (Sheerin) – General comment: This SPC manages *Design Construction and Operation of High Performance Sustainable Healthcare Facilities* – doc used for alignment with former Std 189.1 and 2018 International Green Construction Code.
- c) Std. 188 (Stewart) – no formal comments. Reported update in virtual chat space but it was not captured.
- d) Std. 90.1 () – no update
- e) Std. 55 (Poots) – meets 06/20/20 – looking at topic of air movement in regards to COVID-19 – will be discussed re: healthcare.
- f) Std. 62 : no report.
- g) MTG Ventilation Air Changes Rates (Lautz) – meeting later in conference.
 - i) research in progress regarding history and foundational support behind ACH design specifications
 - ii) Not a whole lot new – 2-way street – what are TC 9.6’s requests
 - iii) Q from TH for MTG: How many portable HEPA’s per sq-ft – how many ACH in business/office space (non-healthcare) spaces? How many for certain situations?
 - (1) Roger has one research paper – performance depends on inlet location positioning relative to source.
 - iv) Q from Ken M – if MTG plan to recommend deviation from ACH design specs– shifting towards a perf specs design requirement – would be helpful if MTG also identified what the test mechanism would be for determining successful operation/compliance.
 - v) Paul S statement: source control role in perf specs also of interest.
 - vi) Additional Questions – email roger at: rlautz@aeieng.com
- h) TC 7.9 (Building Commissioning) – No report

12) Presentation 1: (Steve Friedman) *Risk Mitigation Strategies for MEP Healthcare Infrastructure - Pandemic Preparedness*
(Slides in Appendix F)

- a) 400k known cases/31K deaths ~ 8% per NY State , ~65% NYC, ~25% Long Island – population density matters.
- b) Portable hand washing, hot water, O2 generators freezing up, shedding non-essential load to meet demand, RH 40-60% per local ICP SMEs
- c) Future design Considerations for Emergency Preparedness
 - i) Consider building wide exhaust air capacities to meet or exceed your supply air quantities
 - ii) Consider VAV/CV air distribution “tracking pair” design for clinical areas
 - iii) Consider flow distribution flexibility for your chiller plant in both series and parallel configurations
 - iv) Consider the methodology to add temporary medical gas equipment to your existing distribution
 - v) Consider adding spare electrical distribution placed strategically for roll up equipment support
 - vi) Ensure robust electrical infrastructure for your information technology and communication systems
 - vii) Consider your major energy movers and energy sources to be ABOVE potential flood elevations

13) Presentation 2: (Joe Buri) *Insight on challenges/response to COVID-19 in the early days from a hospital system.*]

- a) Location: SE part of NC, Lumberton, NC, rural town, 452 beds, 61K emer patients/yr, 15K inpatients
- b) Two primary sources of COVID-19 cases – Pork/chicken processing, LTC facilities
- c) Discussed challenges – surge planning – numbers fewer than planned for
- d) Started 16 + 3 NP room – converted large area NP spaces
- e) Shared all of the conversion challenges with facilities/persons who requested info
- f) Follow-up questions – send to TH or DE

14) New Business - TH provided overview of ASHRAE Epi Task Force (see chair slides Appendix B)

- a) Background, formation, mission focus, participants
- b) Up to 500 Questions responded to from ASHRAE’s COVID-19 web page
- c) Healthcare/LTC one of the main focus areas
- d) Dental – Supan – see 1-page handout from ID SubCmte report
- e) Eldridge – USACE – ashrae invited to collaborate with USACE to produce a guidebook that can be used with alt care sites. Temp facility, assembled large team, lots of gov (DoD, VA, CDC) reps, TC reps. Supply/exhaust, bed layout,

enclosed, open pods, if someone wants to join the effort – contact David. Goal have something done by next month in case 2nd surge were to come – provide guidebook – provides Background for USACE Project Work Statement (PWS). Shows prioritization (best practice, acceptable practice, justifications, flexibility is the key – thus not mandates). Looking to add case studies. Hopefully will be ready by next emergency.

- f) Fauber – Residential Healthcare: residential healthcare group, LTC, hospice, memory care, post-acute,looking at best practice, how to keep residents connected to their communities w/o getting covid, heavy emphases on screening, surface disinfection, practice varies among institutions, HVAC focus, residential HVAC designs – are they appropriate. Focus on diff. cleaning technologies. 4-5 people helping, including FGI reps, send Jeremy message if interested in helping.

- i) Discussion ensued from Paul N. – Jeremy's work should have impact upon sspe 170 – not sure when/where/how

- 15) **Closing Remarks:** Chair TH provided big Thank you to everyone for all the efforts, volunteer time, professionalism, etc... during this trying period.

16) Meeting adjourned at 3:02 pm

APPENDIX A

Sign-in Roster – Full Committee plus subcommittees combined

| First Name | Last Name | Phone Number | E-mail | Affiliation / Company | YEA member? | ASHRAE or TC membership status | Which meeting(s) are you attending? |
|---------------|------------------|----------------|------------------------------------|---|-------------|--|---|
| Sean | Hecker | (316) 262-2691 | sean.hecker@pec1.com | PEC | What? | I'm an ASHRAE member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Roger | Lautz | (608) 236-1110 | rlautz@aeieng.com | Affiliated Engineers | No | I'm an ASHRAE memberI'm a TC voting member | Main TC meeting |
| Scott | Hammond | (740) 277-9286 | shammond@nemiconline.org | NEMIC | Yes | I'm an ASHRAE member | Main TC meeting |
| Jonathan | Flannery | (501) 813-2400 | jflannery@aha.org | ASHE | | I'm an ASHRAE member | Main TC meeting |
| Jeff | Gatlin | (901) 237-3378 | jeff.gatlin.pe@gmail.com | Aramark Healthcare (St Jude Children's Research Hosp) | No | I'm an ASHRAE memberI'm a TC corresponding member | Main TC meeting |
| Ronald Westbr | Ronald Westbrook | (315) 420-7269 | rwestbrook@twcny.rr.com | | No | I'm a TC corresponding member | Main TC meeting |
| Brendon | Burley | (443) 500-7685 | brendon.burley@gmail.com | Burdette, Koehler, Murphy and Associates | No | I'm a TC corresponding member | Main TC meeting |
| Viken | Koukounian | (647) 464-6800 | viken@logison.com | K. R. Moeller Associates Ltd. | Yes | I'm an ASHRAE member | Main TC meeting |
| KAPIL | MEHROTRA | (981) 020-2450 | KAPILMEHROTRA10@GMAIL.COM | BLUE STAR | No | I'm an ASHRAE memberI'd like to become a TC corresponding member | Main TC meeting |
| duncan | curd | (647) 403-4328 | duncan.curd@dristeem.com | dristeem | What? | I'd like to become a TC corresponding member | Main TC meeting |
| Ronald Westbr | Ronald Westbrook | (315) 420-7269 | rwestbrook@twcny.rr.com | retired | No | I'm a TC corresponding member | Handbook |
| Ronald Westbr | Ronald Westbrook | (315) 420-7269 | rwestbrook@twcny.rr.com | | No | I'm a TC corresponding member | Program |
| John | Aykroyd | (972) 809-0862 | john.aykroyd@nch.com | Chem-Aqua | No | I'm an ASHRAE member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Erica | Eskins | (419) 217-3821 | erica@watermanagementadvisors.com | Water Management Advisors, Ltd. | What? | I'd like to become a TC corresponding member | Infectious DiseasesResearchMain TC meeting |
| Tom | Mastbaum | (937) 823-2029 | tom.mastbaum@tem-associates.com | TEM Associates, LLC | No | I'm a TC corresponding member | Main TC meeting |
| Sama | Fakhimi | | sfakhimi@aafintl.com | AAF Flanders | Yes | I'm an ASHRAE memberI'd like to become a TC corresponding member | Main TC meeting |
| Chris | Kirchner | (571) 482-0958 | ckirchner@jjkllc.com | Kirlin Design Build, LLC | No | I'm an ASHRAE memberI'm a TC corresponding member | Main TC meeting |
| W. Vance | Payne | (301) 975-6663 | sh9@ashrae.net | NIST | No | I'm an ASHRAE member | Main TC meeting |
| Mark | Malkin | (608) 263-3371 | mmalkin@wisc.edu | University of Wisconsin - Madison | No | I'm an ASHRAE member | Main TC meeting |
| Heather | Schopplein | | hschopplein@gmail.com | UMEC | No | I'd like to become a TC corresponding member | Main TC meeting |
| Glenn | Gall | (916) 452-7640 | glennagall@alumni.nd.edu | State of CA OSHPD | No | I'm an ASHRAE memberI'm a TC corresponding member | Main TC meeting |
| Erica | Stewart | (510) 847-4071 | erica.stewart@kp.org | Kaiser Permanente | No | I'm an ASHRAE member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Rick | Hermans | | Herma015@umn.edu | | No | I'm an ASHRAE member | Main TC meeting |
| Ted | Folstad | | tfolstad@precisionairproducts.com | Precision Air | No | I'm a TC corresponding member | ResearchMain TC meeting |
| Kathleen | Owen | | kathleenowen@att.net | Owen Air Filtration Consulting | No | I'm an ASHRAE member | Main TC meeting |
| Michael | Sheerin | (407) 487-1201 | michael.sheerin@tlc-eng.com | TLC ENGINEERING SOLUTIONS, INC. | No | I'm a TC corresponding member | Main TC meeting |
| Paul | Ninomura | (206) 615-2095 | Paul.Ninomura@ihs.gov | Indian Health Service | No | I'm an ASHRAE memberI'm a TC voting member | Main TC meeting |
| Arun | Cherian | (965) 966-2572 | arunjc89@gmail.com | KEOIC | No | I'd like to become a TC corresponding member | Main TC meeting |
| Zahra | Sardoueinassab | | zahras@nailor.com | R&D Engineer | No | I'm an ASHRAE member | Main TC meeting |
| Tim | Earhart | (814) 241-7463 | tearhart@mbpce.com | MBP | No | I'm an ASHRAE memberI'm a TC voting member | Main TC meeting |
| Rick | Peters | (206) 390-5098 | rp@tbs-engineering.com | TBS Engineering | No | I'm an ASHRAE memberI'm a TC corresponding member | Main TC meeting |
| Kishor | Khankari | (734) 327-4079 | kishork@ansight.com | AnSight LLC | No | I'm an ASHRAE memberI'm a TC corresponding member | Main TC meeting |
| LINDA | Lee | (281) 639-0386 | Linda@lindaleehealthcarehcllc.org | Healthcare Consultants LLC | No | I'm an ASHRAE memberI'm a TC voting member | Main TC meeting |
| ARDAS | SABUNCUYAN | (214) 240-8856 | ardas1968@gmail.com | TDINDUSTRIES | No | I'm an ASHRAE memberI'm a TC corresponding member | Main TC meeting |
| Sarah | Toy | (402) 991-5520 | stoy@specializedeng.com | SES | Yes | I'm a TC corresponding member | Main TC meeting |
| Jeremy | Fauber | (937) 224-0861 | jpfauber@heapy.com | HEAPY | No | I'm an ASHRAE memberI'm a TC voting member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Pavel | Likhonin | (919) 525-0415 | plikhonin@dewberry.com | Dewberry | Yes | I'm an ASHRAE memberI'm a TC voting member | Main TC meeting |
| Linda | Lee | (281) 639-0386 | Linda@lindaleehealthcarehcllc.org | Healthcare Consultants LLC | No | I'm an ASHRAE memberI'm a TC voting member | Program |
| duncan | curd | (647) 403-4328 | duncan.curd@dristeem.com | DriSteem | What? | I'd like to become a TC corresponding member | Program |
| Alejandro | Falcon Bonilla | (050) 694-1996 | alejandros.falconbonilla@aecom.com | Associate AECOM MEng CEng MCIBSE MASHRAE-HFDP MASHE-CHF | No | I'm an ASHRAE memberI'm a TC corresponding member | ProgramHandbookMain TC meeting |
| Paul | Ninomura | (206) 615-2095 | Paul.Ninomura@ihs.gov | Indian Health Service | No | I'm an ASHRAE memberI'm a TC voting member | Research |
| Jonathan | Hunley | (859) 250-1085 | jhunley@mercy.com | Bon Secour Mercy Health | Yes | I'm an ASHRAE memberI'm a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Roger | Lautz | (608) 236-1110 | rlautz@aeieng.com | Affiliated Engineers | No | I'm an ASHRAE memberI'm a TC voting member | Handbook |
| Glenn | Gall | (916) 452-7640 | glennagall@alumni.nd.edu | State of California - OSHPD | No | I'm an ASHRAE memberI'm a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
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| Ronald Westbr | Ronald Westbrook | (315) 420-7269 | rwestbrook@twcny.rr.com | retired | No | I'm a TC corresponding member | Infectious Diseases |
| Tyler | Anderson | (972) 438-0871 | tyler.anderson@chemaqua.com | Chem-Aqua | Yes | I'm an ASHRAE member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Dan | Koenigshofer | (919) 612-6173 | dkoenigshofer@dewberry.com | Dewberry Engineers | No | I'm a TC voting member | HandbookResearchMain TC meeting |
| Erick | Phelps | (941) 465-0788 | ephelps@ssr-inc.com | SSR | No | I'm an ASHRAE memberI'm a TC corresponding member | HandbookResearchMain TC meeting |
| Ken | Mead | (513) 841-4385 | kmead@cdc.gov | CDC/NIOSH | No | I'm an ASHRAE memberI'm a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Harris | Sheinman | (404) 217-2582 | lyy9@cdc.gov | Centers for Disease Control and Prevention | No | I'd like to become a TC corresponding member | Handbook |
| Kevin | Scarlett | (360) 688-0771 | kevin.scarlett@doh.wa.gov | | No | I'm an ASHRAE memberI'd like to become a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Juli | Johnson | (404) 606-2161 | jjohnson@newcomb-boyd.com | Newcomb & Boyd | No | I'm an ASHRAE memberI'd like to become a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Michael | Sheerin | (407) 487-1201 | michael.sheerin@tlc-eng.com | TLC ENGINEERING SOLUTIONS, INC. | No | I'm a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| duncan | curd | (647) 403-4328 | duncan.curd@dristeem.com | DriSteem | What? | I'd like to become a TC corresponding member | Handbook |
| Josephine | Lau | (402) 554-2079 | jlau3@unl.edu | University of Nebraska | No | I'm an ASHRAE memberI'm a TC corresponding member | Infectious DiseasesHandbookResearchMain TC meeting |

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|-----------|----------------|----------------|-----------------------------------|---|-------|---|---|
| ARDAS | SABUNCUYAN | (214) 240-8856 | ardas1968@gmail.com | TDINDUSTRIES. | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Nicolas | Lemire | (514) 953-3996 | nlemire@pageaumorel.com | Pageau Morel | No | I'm an ASHRAE member I'm a TC voting member | Infectious DiseasesHandbookResearchMain TC meeting |
| Mark | Tome | (717) 814-8237 | mark.tome@alumni.psu.edu | Sitelogiq | No | I'm a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Viken | Koukounian | (647) 464-6800 | viken@logison.com | K. R. Moeller Associates Ltd. | Yes | I'm an ASHRAE member | ProgramHandbookResearch |
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| David | Thomsen | | david.thomsen@providence.org | Providence | No | I'm a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
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| Eric | Granzow | (309) 269-8767 | EGRANZOW@SPECIALIZEDENG.COM | SES | No | I'm an ASHRAE member I'm a TC voting member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Tom | Parker | (416) 553-6713 | parkerth@smh.ca | Unity Health Toronto | Yes | I'm an ASHRAE member I'd like to become a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Oscar | Cobb Jr | (248) 910-5126 | ocobb2@gmail.com | SmithGroup | No | I'm an ASHRAE member I'm a TC corresponding member | ResearchMain TC meeting |
| Mark | Bender | (619) 704-1900 | mbender@benderdean.com | Bender Dean Engineering | Yes | I'd like to become a TC corresponding member | ProgramHandbookMain TC meeting |
| Eric | Granzow | (309) 269-8767 | EGRANZOW@SPECIALIZEDENG.COM | SES | No | I'm an ASHRAE member I'm a TC voting member | Handbook |
| Tom | Parker | (416) 553-6713 | parkerth@smh.ca | Unity Health Toronto | Yes | I'm an ASHRAE member I'd like to become a TC corresponding member | Handbook |
| Gina | Semerad | (212) 530-9454 | semeradg@jbb.com | JB&B | No | I'd like to become a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Tim | Earhart | (814) 241-7463 | tearhart@mbpce.com | MBP | No | I'm an ASHRAE member I'm a TC voting member | ProgramHandbookResearch |
| Glenn | Gall | (916) 452-7640 | glennngall@alumni.nd.edu | State of CA OSHPD | What? | I'm an ASHRAE member I'm a TC corresponding member | Research |
| Jeremy | Fauber | (937) 224-0861 | jpfauber@heapy.com | HEAPY | No | I'm an ASHRAE member I'm a TC voting member | Program |
| Dylan | Neu | (513) 841-4549 | xhw2@cdc.gov | CDC/NIOSH | Yes | I'm an ASHRAE member | ResearchMain TC meeting |
| Erica | Stewart | (510) 847-4071 | erica.stewart@kp.org | Kaiser Permanente | | I'm an ASHRAE member | Infectious Diseases |
| Dan | Koenigshofer | (919) 612-6173 | dkoenigshofer@dewberry.com | Dewberry Engineers | No | I'm a TC voting member | Infectious Diseases |
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| Dan | Koenigshofer | (919) 612-6173 | dkoenigshofer@dewberry.com | Dewberry Engineers | No | I'm a TC voting member | Research |
| James | Piscopo | (732) 768-4232 | james.piscopo@gmail.com | Ballinger | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Traci | Hanegan | | | | No | I'm an ASHRAE member I'm a TC voting member | ProgramHandbookMain TC meeting |
| Mustafa | Morsy | (905) 921-8951 | morsymhh@gmail.com | DEI Consulting Engineers | Yes | I'd like to become a TC corresponding member | ProgramHandbookResearchMain TC meeting |
| Alejandro | Falcon Bonilla | (050) 694-1996 | alejandro.falconbonilla@aecom.com | Associate AECOM MEng CEng MCIBSE MASHRAE-HFDP MASHE-CHF | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious DiseasesProgram |
| David | Eldridge | (773) 490-5038 | deldridge@grummanbutkus.com | Grumman/Butkus Associates | No | I'm an ASHRAE member I'm a TC voting member | Infectious DiseasesProgramHandbookResearchMain TC meeting |
| Alejandro | Falcon Bonilla | (050) 694-1996 | alejandro.falconbonilla@aecom.com | Associate AECOM MEng CEng MCIBSE MASHRAE-HFDP MASHE-CHF | No | I'm an ASHRAE member I'm a TC corresponding member | Research |
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| Glenn | Gall | (916) 452-7640 | glennngall@alumni.nd.edu | State of CA OSHPD | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious Diseases |
| John | Carter | (970) 219-1773 | jcarter@cppwind.com | CPPInc | No | I'm an ASHRAE member I'm a TC voting member | Research |
| duncan | curd | (647) 403-4328 | duncan.curd@dristeem.com | DriSteem | What? | I'd like to become a TC corresponding member | Research |
| Gwenn | Vester | | givester@live.com | Cushman & Wakefield | No | I'm an ASHRAE member | Infectious Diseases |
| Kishor | Khankari | (734) 327-4079 | kishork@ansight.com | AnSight LLC | No | I'm an ASHRAE member I'm a TC corresponding member | Research |
| Kevin | Scarlett | (360) 688-0771 | kevin.scarlett@doh.wa.gov | WA State DOH | No | I'm an ASHRAE member | Research |
| Mark | Bender | (619) 704-1900 | mbender@benderdean.com | Bender Dean Engineering | Yes | I'd like to become a TC corresponding member | Research |
| Mark | Tome | (717) 814-8237 | mark.tome@alumni.psu.edu | Sitelogiq | No | I'm a TC corresponding member | Research |
| Julie | Johnson | (404) 606-2161 | jjohnson@newcomb-boyd.com | Newcomb & Boyd | No | I'm an ASHRAE member I'd like to become a TC corresponding member | Research |
| KAPIL | MEHROTRA | (981) 020-2450 | KAPILMEHROTRA10@GMAIL.COM | BLUE STAR | No | I'm an ASHRAE member I'd like to become a TC corresponding member | Research |
| Ken | Mead | (513) 841-4385 | kmead@cdc.gov | CDC/NIOSH | No | I'm an ASHRAE member I'm a TC corresponding member | Research |
| Viken | Koukounian | (647) 464-6800 | viken@logison.com | K. R. Moeller Associates Ltd. | Yes | I'm an ASHRAE member | Infectious Diseases |
| Glenn | Gall | (916) 452-7640 | glennngall@alumni.nd.edu | State of CA OSHPD | No | I'm a TC corresponding member | Infectious Diseases |
| Harris | Sheinman | (404) 217-2582 | lly9@cdc.gov | Centers for Disease Control and Prevention | No | I'd like to become a TC corresponding member | Handbook |
| Roger | Lautz | (608) 236-1110 | rlautz@aeieng.com | Affiliated Engineers | No | I'm an ASHRAE member I'm a TC voting member | Research |
| Erica | Eskins | (419) 217-3821 | erica@watermanagementadvisors.com | Water Management Advisors, Ltd. | What? | I'd like to become a TC corresponding member | Research |
| Jonathan | Hunley | (859) 250-1085 | jhunley@mercy.com | Bon Secour Mercy Health | Yes | I'm an ASHRAE member I'm a TC corresponding member | Research |
| Viken | Koukounian | (647) 464-6800 | viken@logison.com | K. R. Moeller Associates Ltd. | Yes | I'm an ASHRAE member | Research |
| Ted | Folstad | | tfolstad@precisionairproducts.com | Precision Air | No | I'm a TC corresponding member | Research |
| ARDAS | SABUNCUYAN | (214) 240-8856 | ardas1968@gmail.com | TDINDUSTRIES | No | I'm an ASHRAE member I'm a TC corresponding member | Research |
| Glenn | Gall | (916) 452-7640 | glennngall@alumni.nd.edu | State of CA OSHPD | No | I'm an ASHRAE member I'm a TC corresponding member | Handbook |
| Tom | Parker | (416) 553-6713 | parkerth@smh.ca | Unity Heath Toronto | Yes | I'm an ASHRAE member I'd like to become a TC corresponding member | Research |
| Erick | Phelps | (941) 465-0788 | ephelps@ssr-inc.com | SSR | No | I'm an ASHRAE member I'm a TC corresponding member | Research |
| Sean | Hecker | (316) 262-2691 | sean.hecker@pec1.com | PEC | What? | I'm an ASHRAE member I'm a TC corresponding member | Research |
| Jeremy | Fauber | (937) 224-0861 | jpfauber@heapy.com | HEAPY | No | I'm an ASHRAE member I'm a TC voting member | Research |
| Traci | Hanegan | (509) 328-2994 | hanegan@coffman.com | Coffman Engineers | No | I'm an ASHRAE member I'm a TC voting member | Research |
| Erica | Stewart | (510) 847-4071 | erica.stewart@kp.org | Kaiser Permanente | No | I'm an ASHRAE member | Research |
| LINDA | Lee | (281) 639-0386 | Linda@lindaleehealthcarehcllc.org | Healthcare Consultants LLC | No | I'm an ASHRAE member I'm a TC voting member | Research |
| Gina | Semerad | (212) 530-9454 | semeradg@jbb.com | JB&B | No | I'd like to become a TC corresponding member | Research |
| Arun | Cherian | (965) 966-2572 | arunj89@gmail.com | KEOIC | No | I'd like to become a TC corresponding member | Research |
| Arun | Cherian | (965) 966-2572 | arunj89@gmail.com | KEOIC | No | I'd like to become a TC corresponding member | Handbook |
| Eric | Granzow | (309) 269-8767 | EGRANZOW@SPECIALIZEDENG.COM | SES | No | I'm an ASHRAE member I'm a TC voting member | Research |
| Arun | Cherian | (965) 966-2572 | arunj89@gmail.com | KEOIC | No | I'd like to become a TC corresponding member | Program |

| | | | | | | | |
|-------------------|------------|----------------|------------------------------------|--|-------|---|---------------------|
| Tyler | Anderson | (972) 438-0871 | tyler.anderson@chemaqua.com | Chem-Aqua | Yes | I'm an ASHRAE member | Infectious Diseases |
| John | Carter | (970) 219-1773 | jcarter@cppwind.com | CPP Inc | No | I'm an ASHRAE member I'm a TC voting member | Infectious Diseases |
| Mustafa | Morsy | (905) 921-8951 | morsymhh@gmail.com | DEI Consulting Engineers | Yes | I'm an ASHRAE member I'd like to become a TC corresponding member | Infectious Diseases |
| ARDAS | SABUNCUYAN | (214) 240-8856 | ardas1968@gmail.com | TDINDUSTRIES | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious Diseases |
| Tim | Earhart | (814) 241-7463 | tearhart@comcast.net | MBP | No | I'm an ASHRAE member I'm a TC voting member | Infectious Diseases |
| Pavel | Likhonin | (919) 526-0415 | plikhonin@dewberry.com | Dewberry | Yes | I'm an ASHRAE member I'm a TC voting member | Research |
| KAPIL | MEHROTRA | (981) 020-2450 | KAPILMEHROTRA10@GMAIL.COM | BLUE STAR | | I'm an ASHRAE member I'd like to become a TC corresponding member | Infectious Diseases |
| LINDA | Lee | (281) 639-0386 | Linda@lindadleehealthcarehcllc.org | Healthcare Consultants LLC | No | I'm an ASHRAE member I'm a TC voting member | Infectious Diseases |
| Pavel | Likhonin | (919) 526-0415 | plikhonin@dewberry.com | Dewberry | Yes | I'm an ASHRAE member I'm a TC voting member | Program |
| Pave | Likhonin | (919) 526-0415 | plikhonin@dewberry.com | Dewberry | Yes | I'm an ASHRAE member I'm a TC voting member | Handbook |
| Chris | Kirchner | (571) 482-0958 | cgk868@gmail.com | Kirlin Design Build, LLC | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious Diseases |
| Josephine | Lau | (402) 554-2079 | jlau3@unl.edu | University of Nebraska | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious Diseases |
| Kishor | Khankari | (734) 327-4079 | kishork@ansight.com | AnSight LLC | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious Diseases |
| Jeremy | Fauber | (937) 224-0861 | jpfauber@heapy.com | HEAPY | No | I'm an ASHRAE member I'm a TC voting member | Infectious Diseases |
| Shannon | Schmidt | (618) 616-6411 | shannon.schmidt@aafintl.com | AAF/Flanders | What? | I'm an ASHRAE member | Infectious Diseases |
| Tom | Mastbaum | (937) 823-2029 | tom.mastbaum@tem-associates.com | TEM Associates, LLC | No | I'm an ASHRAE member I'm a TC corresponding member | Main TC meeting |
| Steve | Friedman | (917) 217-3763 | sdfpe@optimum.net | Memorial Sloan Kettering Cancer Center | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious Diseases |
| David | Thomsen | | david.thomsen@providence.org | Providence | No | I'm a TC corresponding member | Infectious Diseases |
| Brendon | Burley | (443) 500-7685 | brendon.burley@gmail.com | Burdette, Koehler, Murphy and Associates | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious Diseases |
| Tom | Parker | (416) 553-6713 | parkerth@smh.ca | Unity Health Toronto | Yes | I'm an ASHRAE member I'd like to become a TC corresponding member | Infectious Diseases |
| Eric | Granzow | (309) 269-8767 | EGRANZOW@SPECIALIZEDENG.COM | SES | No | I'm an ASHRAE member I'm a TC voting member | Infectious Diseases |
| Arun | Cherian | (965) 966-2572 | arunjc89@gmail.com | KEOIC | No | I'd like to become a TC corresponding member | Infectious Diseases |
| duncan | curd | (647) 403-4328 | duncan.curd@dristeem.com | DriSteem | What? | I'm an ASHRAE member I'd like to become a TC corresponding member | Infectious Diseases |
| Wenhong (Eddi)Xue | | (703) 325-2151 | wenhong.xue@usace.army.mil | Medical Center for Expertise | No | I'm an ASHRAE member | Infectious Diseases |
| Traci | Hanegan | (509) 328-2994 | hanegan@coffman.com | Coffman Engineers | No | I'm an ASHRAE member I'm a TC voting member | Infectious Diseases |
| Mark | Tome | (717) 814-8237 | mark.tome@alumni.psu.edu | SiteLogiq | No | I'm an ASHRAE member I'm a TC corresponding member | Infectious Diseases |
| Jonathan | Hunley | (859) 250-1085 | jhunley@mercy.com | Bon Secour Mercy Health | Yes | I'm an ASHRAE member I'm a TC corresponding member | Infectious Diseases |
| Gina | Semerad | (212) 530-9454 | semeradg@jbb.com | JB&B | No | I'd like to become a TC corresponding member | Infectious Diseases |

APPENDIX B

TC 9.6 Chair's Slide Presentation for virtual meeting and report from chair's breakfast



TC 9.6 Healthcare Facilities

Main Meeting
Friday, June 19, 2020
1:00-3:00 p.m. (EDT)

Zoom Tips

- Open “Participants” on Zoom
- If your full name is not displayed, please highlight your name, select “More” and use rename to add our full name.
- Make sure you are on “Mute” unless you are talking or getting ready to talk.
- Keep your webcam off to minimize band width requirements.

Attendance Sheet

Please go to <https://form.jotform.com/201688427015152> and fill out the form so we have a record of your attendance at today's meeting.

Agenda

| Item | Description | Person | Time (min) |
|------|--|-----------------|------------|
| 1 | Introductions, agenda, conference call and attendance documentation instructions | Hanegan | 5 |
| 2 | <u>Roll</u> call, quorum check. | Mead | 2 |
| 3 | Environmental Health Committee Liaison Report & Overview of new position document | Stewart | 8 |
| 4 | Minutes a) Orlando minutes will be reviewed and voted on by email ballot following the Austin Meeting | Mead | 1 |
| 5 | Vice Chair's Comments | Lemire | 2 |
| 6 | Membership Chair Report, Roster Changes, Welcome PCM's | Westbrook | 3 |
| 7 | Chair's Report TAC Breakfast Meeting | Hanegan | 2 |
| 8 | Energy Subcommittee Report | Eldridge | 2 |
| 9 | Programs Subcommittee Report | Tome | 3 |
| 10 | Handbook Subcommittee Report | <u>Likhonin</u> | 3 |
| 11 | Research Subcommittee Report | Thomsen | 6 |
| 12 | Infectious Diseases Subcommittee Report | Mead | 10 |

Agenda

| | | | |
|----|--|--|----------------------------|
| 13 | Webmaster Report | <u>Augustini</u> | 2 |
| 14 | Std170 Operations Guide | Westbrook | 4 |
| 15 | ALI | Koenigshofer <u>Likhonin</u> | 2 |
| 16 | Insight on challenges/response to COVID-19 in the early days from a hospital system. | Buri | 9 |
| 17 | MTG Ventilation Rates (ACH or cfm/sf) | Lautz | 2 |
| 18 | Liaison Reports -Std. 170 -Std. 189.3 -Std. 188 -Std 90.1 -Std 55 -Std 62 | Fauber Sheerin Stewart Boldt <u>Poots / Mora</u> <u>Darwich</u> | 3 2 2 2 2 2 |
| 19 | Epidemic Task Force: Reports from individual task groups, including Dental, USACE Alt. Care Sites, and Residential Healthcare. | <u>Supan</u> Eldridge Fauber | 15 |
| 20 | Lessons Learned: What were the big surprises and where did existing guidance fell short of helping your facility meet its mission? | Friedman | 15 |
| 21 | Other New Business – Ongoing Epidemic Task Force work for TC9.6, Co-sponsor Climate Change seminar for Chicago by TC2.5. | Hanegan | 9 |
| 22 | Closing Remarks | Hanegan | 2 |

In all your interactions at these meetings,
please remember...

Code of Ethics

“As members of ASHRAE or participants in ASHRAE activities, we pledge to act with honesty, fairness, courtesy, competence, integrity and respect for others in our conduct. We will avoid conflicts of interest and behavior that is discriminatory and/or harassing.”



TC9.6 Scope

TC 9.6 is concerned with the application of ventilating, air-conditioning, refrigeration, life safety, and energy conservation systems to healthcare (hospital, outpatient, long-term care) facilities.









Voting Members Roll Call – Ken Mead

☐ Traci Hanegan, Chair

☐ Nick Lemire, Vice Chair

☐ Pavel Likhonin

☐ Jeremy Fauber

☐ Eric Granzow

☐ David Eldridge

☐ Roger Lautz

☐ George Augustini

☐ Dan Koenigshofer

☐ John Carter

☐ Zach Poots

☐ Melvin Glass

☐ Paul Supan

☐ Walter Vernon

☐ Tim Earhart

Environmental Health Committee

Erica Stewart

<https://www.ashrae.org/technical-resources/resources>

NEW ASHRAE Position Document on Infectious Aerosols

On April 14, 2020, the ASHRAE Board of Directors approved the ASHRAE Position Document on Infectious Aerosols. This position document replaces the ASHRAE Position Document on Airborne Infectious Diseases. This position document outlines ASHRAE's position that facilities of all types should follow, as a minimum, the latest published standards and guidelines and good engineering practice. Based on risk assessments or owner project requirements, designers of new and existing facilities could go beyond the minimum requirements of these standards, using techniques covered in various ASHRAE publications, including the ASHRAE Handbook volumes, Research Project final reports, papers and articles, and design guides, to be even better prepared to control the dissemination of infectious aerosols.

 [ASHRAE Position Document on Infectious Aerosols](#)

 [En Español](#)

 [Em Português](#)

Vice Chair Comments

Membership Report – Ron Westbrook

- 242 overall members
- 15 Voting members
- 97 Provisional Corresponding members (44 since Orlando winter meeting).
- 8 PCM terms due to expire June 30, participation credits not yet confirmed.
- Continued committee membership after 2-year term as PCM requires participation in TC activities consisting of attendance at any TC subcommittee meetings, main TC meeting, or documented action in response to a committee request for technical paper reviews, conference paper reviews, RTAR's, or work statements during two year provisional term.
- Consideration for voting member status is based on the member's record of participation with the TC. Participation on a subcommittee is a prerequisite to eligibility as a voting member.

TC9.6 Subcommittees

- Handbook (HVAC Applications, Chapter 8)
- Research
- Standards (includes participation on TC 9.6 sponsored standard committees and/or as TC Liaison to cognizant standard committees 55, 62, 90, 188, 189)
- Programs
- Membership
- Healthcare Energy subcommittee
- Infectious Diseases subcommittee
- Honors and Awards
- Webmaster
- ALI Coordinator
- Chapter Technology Transfer
- TC associated MTG's (MTG-ACR, Air exchange rates)

Roster Changes – Effective 8/1/2020

Rolling Off

- Nick Lemire Co-Chair (rolling off for one year, must roll on for July 2021)
- Tim Earhart (second completed term as voting member).

Rolling On

- Amit Bhansali
- Dylan Neu

Join TC9.6

[Home](#)[Membership](#)[Meetings](#)[Documents](#)[Functions](#)[More](#)

Member Roster

Current as of 6/19/2020

[Join TC 9.6](#)

If you want to become a provisional corresponding member of this TC, click on the "Join TC" button above. You will be automatically added to the roster and will receive all TC communications.

Committee members can download a copy of the complete roster in any of three formats by logging in to their ASHRAE member account, clicking on my account and selecting Committees.

A provisional corresponding member is a two year appointment. Once you demonstrate your engagement by participating in one or more of our subcommittees your membership will be changed to corresponding member. Once a corresponding member, based on your level of interest, participation, and engagement you can be considered for becoming a voting member of TC 9.6.



Website – <https://tc0906.ashraetcs.org/>



Healthcare Facilities

ASHRAE Technical Committee 9.6

[Home](#)

[Membership](#)

[Meetings](#)

[Documents](#)

[Functions](#)

[More](#)

Agenda

2020 Austin Meeting Agenda TC0906

2020 Winter Orlando Agenda TC9 6

Upcoming TC Meetings

Location: Virtual Conference via ASHRAE 365 APP
(All meeting are listed in Eastern Time)

Wednesday, 06/17/2020

8:00 AM - 9:00 AM RP 1816 PMS meeting

Friday, 06/19/2020

8:00 AM - 10:00 AM Infectious Diseases

10:00 AM - 1:00 PM Research, Handbook, & Program Sub Committees

1:00 PM - 3:00 PM Main Meeting

[See More](#)

Committee Chair

Traci Hanegan TC0906@ashrae.net

Committee Scope

TC 9.6 is concerned with the application of ventilating, air-conditioning, refrigeration, life safety, and energy conservation systems to healthcare (hospital, outpatient, long-term care) facilities.

[More](#)

Upcoming Society Conferences

2020 Winter Conference
Feb 1-5, 2020
Orlando, FL



Epidemic Task Force (ETF) - Update

- EHC Cognizant to Epidemic Task Force (ETF) per ASHRAE ExCom
 - ETF was established to help deploy ASHRAE's technical resources to address the challenges of the current pandemic and future epidemics as it relates to the effects of heating, ventilation, and air-conditioning systems on disease transmission in healthcare facilities, the workplace, home, public and recreational environments.
- Primary role is for the ETF to communicate with those involved in the built environment:
 - Review all technical questions/requests for technical guidance submitted
 - Coordinating activities of ASHRAE's internal resources
 - Partnering with and monitoring the activities of external organizations, including the more than 60 members of the [ASHRAE Associate Society Alliance \(AASA\)](#) of organizations related to the HVAC&R industry around the world
 - Reviewing, organizing, consolidating and publishing clear and concise summaries with citations of the most relevant information available to the built environment

Epidemic Task Force (ETF) - Update

- Supported expedited update of [Position Document on Infectious Aerosols](#). Board Approved April 14, 2020. (First published in 2009)
- ASHRAE statements on SARS-CoV-2
- Expedited the EIB “Pandemic COVID-19 and Airborne Transmission”
- COVID-19 resources/guidance page ashrae.org/covid19
- Answers to about 500 questions to web site (COVID-19@ashrae.org)
- Meetings with AIA, NYSERDA, DOE, IEA
- Partnership with government on HVAC for alternate care facilities (USACE, USAF, USN, NIOSH)
- Reviewed/commented on state guidance (Florida, Michigan)
- Working on...
 - Immediate guidance for current COVID-19 Pandemic
 - Near term guidance for 2nd wave
 - Long term guidance to future proof

Epidemic Task Force (ETF) - Update

Focus Areas as of June 19, 2020

- Healthcare (including long-term care)
- Residential
- Commercial / retail
- Schools
- Transportation
- Building Readiness
- Resource inventory
- Science/Literature review
- Filtration and disinfection
- Science Applications
- Communications
- Grassroots
- Advocacy / developing economies
- External partnerships

Epidemic Task Force (ETF) - Update

Task Force

- Review Public & Industry Needs
- Creates a content development plan
- Assigns Teams work based on Subject Matter Expertise
- Communicates with ASHRAE Leadership and Board of Directors

Subject Matter Teams

- Determines current state of technology and practice and gaps to be filled
- Creates New or Updates Existing Content
- Performs internal PEER Review
- Respond to questions from Industry and public

Task Force

- Team Leaders Perform PEER Review of other team's work
- Coordinates and harmonizes common between teams
- Gives green light to ASHRAE staff to publish content to website
- Coordinates with outside organizations (AIA, BOMA, CIBSE, ETC.)

Communication Team

- Designed website for ease of access and navigation
- Processes content and post to the web
- Develops press releases and public communication strategies

ASHRAE Support Staff

- Tracks Task Force Activities and Deadlines
- Receives questions and sends to SMEs for response
- Develops lists of FAQs for refinement of responses and posting on web

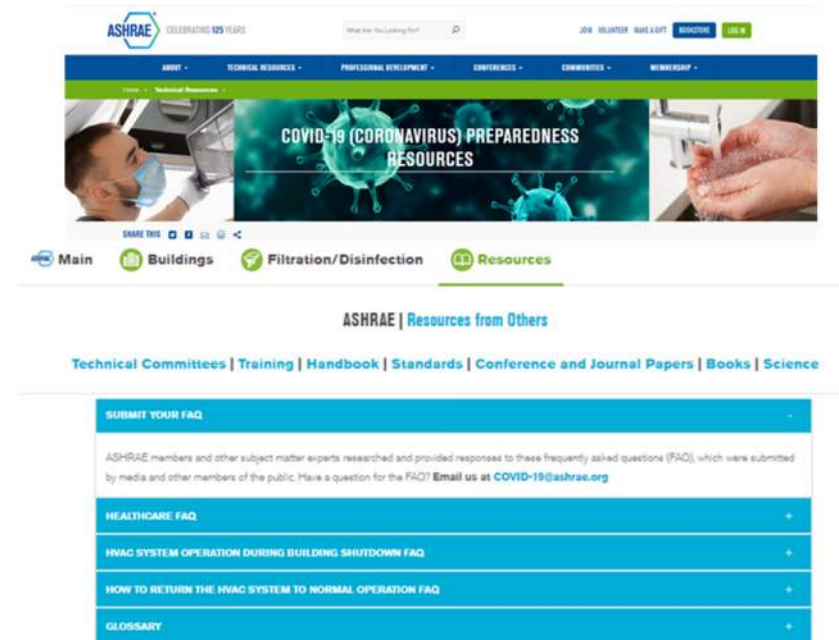
ASHRAE Government Affairs

- Monitors activities of Federal, State, Local and International Governments, Agencies and Policy Makers
- and coordinates with Task Force, SMEs and ASHRAE leadership
- Organizes timely responses to requests for assistance

Epidemic Task Force (ETF) - Update

Representation on the ETF Teams:

- Section 1: 1.4, 1.5, 1.8, 1.9, 1.12
- Section 2: 2.1, 2.2, 2.3, 2.4, 2.5, 2.8, 2.9, 2.10
- Section 3: 3.3, 3.6
- Section 4: 4.1, 4.2, 4.3, 4.4, 4.7, 4.10
- Section 5: 5.3, 5.5, 5.6, 5.10
- Section 6: 6.1, 6.2, 6.5, 6.7, 6.9
- Section 7: 7.1, 7.3, 7.5, 7.6, 7.7, 7.8, 7.9
- Section 8: 8.3, 8.6, 8.10, 8.12
- Section 9: 9.1, 9.2, 9.3, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12
- Section 10: 10.2, 10.6



Epidemic Task Force (ETF) - Update

Voting

- Bill Bahnfleth – Chair, (External Contacts)
- Wade Conlan (Bldg. Readiness, Resources)
- Jason DeGraw (Transportation)
- Traci Hanegan (Healthcare)
- Rick Hermans (Schools, Grassroots)
- Luke Leung (Commercial, Retail)
- Steve Martin (Filtration)
- Jim Ridenhour
- Max Sherman (Residential)
- Stephanie Taylor (Science)

For technical guidance, visit

ashrae.org/covid19

Non-Voting

- Walid Chakroun (Advocacy, GAC)
- Dennis Knight (Communications, ExO)
- Jay Kohler (TAC)
- Wayne Stopplemoor (StdS)

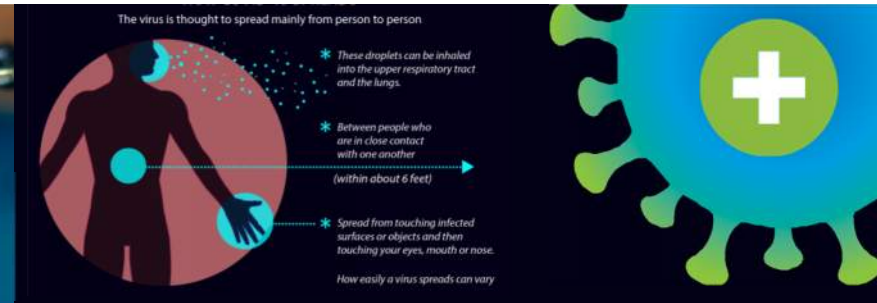
Society Staff

- Vanita Gupta (Director of Marketing)
- Steve Hammerling (Manager of Technical Resources)
- Stephanie Reiniche (Director of Technology)
- Alice Yates (Director of Government Affairs)



ASHRAE EPIDEMIC TASK FORCE

HEALTHCARE | Updated 6-17-2020



BACKGROUND/CONTEXT

- [Modes of Transmission/Aerobiology](#)
- [ASHRAE Statements on Airborne Transmission](#)
- CDC recommends Airborne Infection Isolation rooms for [aerosol generating procedures \(AGPs\)](#)
- [Secondary Infection Susceptibility](#)
- Committing Airborne Infection Isolation rooms for use as inpatient rooms limits future flexibility. Work with clinical staff to establish use requirements.
- [Cohorting – Cautions and current methods.](#)
- See [ASHRAE COVID-19](#)
- ASHRAE members have provided input on [Disaster Planning and Emergency Management for Healthcare Facilities](#). Partner on your local professional engineering partners for input and guidance during this time.

GOALS

- Do No Harm
- Protect Healthcare Workers, Family, and Visitors
- Protect Other Patients
- Empower people to make and carry out the best decision they can.
- Work as a team – weigh competing concerns, define key areas, share the plan.
 - Consider the type of HVAC system, the configuration, clinical needs, facility infrastructure capacity, and limited resources available.

LIFE SAFETY

- Confirm that power-consuming equipment is connected to the appropriate branch of the essential power system.
- Maintain Egress
- Consider defend-in-place plans and smoke compartments
- Increased facility oxygen use elevates risk of a fire spreading more rapidly
- [First responder protection.](#)
- Develop Interim Life Safety Measures as applicable

SUGGESTED APPROACHES

- [Passive Isolation](#)
- [Strategically utilize All Rooms](#)
- [Airflow from Clean to Less Clean](#)
- [Increase Filtration Level if possible](#)
- [Eliminate recirculation or minimize to the extent possible](#)
- [Maintain relative humidity at 40-60%.](#)
- [Evaluate continued operation of heat recovery wheels](#)
- [Improve/Consider room airflow direction/patterns](#)
- [Utilize portable ante rooms/vestibules with HEPA filtration](#)
- Utilize UV light (see [Facilities/Maintenance – Disinfection](#))
- Areas for non-Covid patients should still be treated with care because someone could be unknowingly infected.

SPECIFIC “HOW-TO” AND UNIQUE AREAS

- [Layered approach for normal and small surge operations](#)
- [Source Control Options](#) for patient beds
- [Operating on COVID-19 positive patient](#)
- [Variable Air Volume Adjustments & Modification to economizer or reduced recirc.](#)
- [Cautions on Recirculating Room Units](#) (Fan coils, induction units, etc.)
- [2-person patient rooms](#) – creating or managing existing
- [Use Operating rooms for inpatient rooms/temp ICU](#)
- [Emergency Department](#)
- [Warning on Older ICU units](#)
- Transmission through the air in toilet rooms
- Provide areas for safely doffing PPE, such as shoe cover removal followed by “tacky mats” for personnel exiting an area.
- [Gastrointestinal Endoscopy](#)

SURGE AREAS

- [Initial Considerations](#)
- [Alternate Care Site Design Concepts](#)
- [Single patient room considerations vs. 2-patient rooms](#)
- [General Parameters for ACH, Temp, Filtration, and RH](#)

FACILITIES/MAINTENANCE

- [PPE basics](#)
- [Filter changing](#)
- [Room turnover](#)
- Verify performance of critical HVAC systems – airborne infection isolation rooms, Emergency Departments, etc.
- Disinfection: [Normal, UV, VHP, Hypochlorous Acid](#)
- See [ASHRAE COVID-19 Filtration and Disinfection section for greater detail.](#)
- Considering the possibility of being short-staffed in the future, run-test and re-fuel emergency generator system.
- [Coordinate any planned rescheduling or postponement of Inspection, Testing, Maintenance \(ITM\) with local or state AHJ. Submit waivers as required.](#)
- Check to be sure COVID-19 area AHU return air isn't being used to condition mechanical rooms.
- [Waterborne Pathogen Prevention](#)

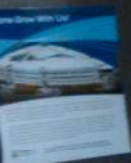
MEDICAL GAS/VACUUM SYSTEMS

- Demand for gasses in [ICU rooms](#)
- Demand for gasses in [med-surg rooms and OR's](#)
- [Accommodating increased demand \(flow\) in fixed piping systems](#)
- [Impact of demand/consumption on existing gas systems](#)
- Consider providing [supplementary gas sources](#)

OTHER

- Reduce # of rooms utilized off a single HVAC system to free up AHU capacity to achieve performance goals. 25 beds with desired airflow/temps better than 30 beds with airflow/temp deficiencies.
- Document the Action Plan and Alternations in Place. Obtain AHJ approval for long-term alternations.
- [Healthcare Team Members](#)
- [Acknowledgements](#)





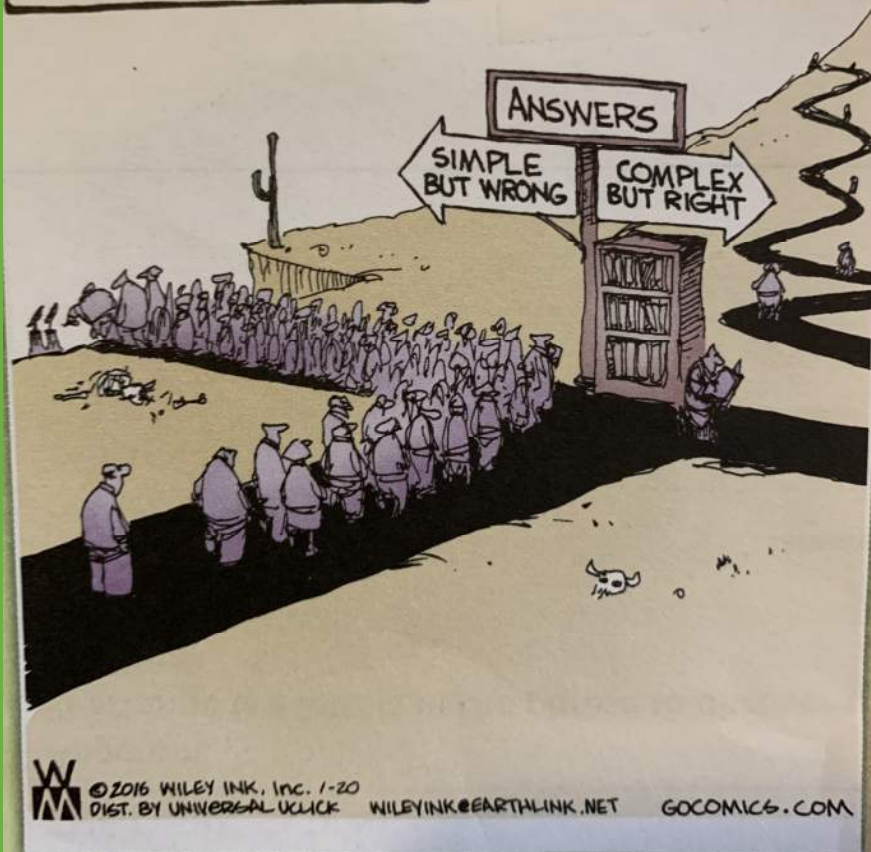
TRACI HANEGAN

Please Gown Up
Before Entering





SCIENCE VS.
EVERYTHING ELSE



Engineering

- Must be Cheaper & Quicker
- Must be Simple and Right

Announcements and Reminders for TC/TG/TRG & MTG Chairs Virtual Annual Meeting 2020

A. **NEW!**

1. **Discuss and confirm that TGs, TRGs, and MTGs in section will continue in 20-21 Society Year**

From TC MOP:

1.5. Review

- 1.5.1.** Once a year, preferably at, or prior to, each Annual meeting, the Committee Chair and Committee Membership shall evaluate their progress in accomplishing the purpose for which they were constituted and recommend one of the following actions to their Section Head:
- Continue as a TC, TG, MTG, or TRG
 - Convert from a TG to a TC
 - Convert from a TRG to a TG or TC
 - Merge with a TC/TG/TRG and submit a revised scope for the merged committee
 - Dissolve the TC, TG, MTG, or TRG.
 - If a TC/TG/TRG/MTG votes to disband, it must establish whether any current responsibilities should be continued and, if so, recommend existing TC/TRG/MTG(s) to assume responsibility and obtain those committee's written concurrence

2. **TC Meeting schedule and protocols**

TC committee meeting schedules posted at www.ashrae.org/conferences/ashrae-2020-virtual-conference. Access to virtual committee meetings will be sent to committee members from either their staff liaison or committee chair.

If you wish to join a committee as a guest, please contact meetings@ashrae.org no later than the close of business the day before the scheduled meeting with the name of the committee, date and time and log-in information will be sent to you.

3. **20-21 Roster Rollover**

Remember, the current 2019-2020 roster for your TC, TG or MTG is in effect until after they meet for the ASHRAE Virtual Conference. Rosters will roll over to 2020-2021 at that point.

4. **Interim TC Meeting Procedures**

TAC is encouraging TC's to meet in between ASHRAE Meeting. TAC will implement the following:

- Maintain a listing of the interim meetings on the Technical Committees webpage (www.ashrae.org/technical-resources/technical-committees), similar to the listing done for Standards.
- TC interim meetings should be posted (by emailing the alias TCmeetings@ashrae.net) two weeks before an online meeting and four weeks before a face-to-face meeting. The person emailing should also include the meeting call-in info/ link for posting.
- To keep our members apprised of the meetings, we will add a notice in the ASHRAE Journal Newsletter (bimonthly) to remind our members to check the listing and to provide a link to the list.

5. New Section Head/TC leadership Basecamp

A new Basecamp (<https://3.basecamp.com/3106353/projects/15520814>) is set up to communicate and transfer documents between TAC Section Heads and TC leadership (Chairs, Vice Chairs, Secretary) at TC members can participate at <https://3.basecamp.com/3106353/join/8MHSs5gveaLg>.

6. TC Re-Org update

TAC has a subcommittee to implement recommendations of TC Re-Org Ad Hoc final report.

For those TC's that have decided to merge, you need to:

- Vote on the revised Title & Scope. Any combining TC's need to be voting on the same TPS.
- Proposed leadership and voting roster need to be completed.
- Please work closely with your Section Head.
- So far, TAC has approved 4 TC mergers – 3.2 & 3.3, 8.10 & 8.12, 9.4 & 9.8, 7.3 & 7.8.

For those TC's still in the discussion phase, please keep your Section Head aware of your discussion status.

7. MTGs that have been formed since Orlando

- **MTG.CYB** (Cybersecurity for HVAC Systems and Related Infrastructure)

8. How to Import Your TC Roster Information into MS-Outlook

Detailed instructions on how to import your TC roster information into MS-Outlook has been created and an e-mail announcement will be issued to all TC chairs, vice chairs, and secretaries once these instructions and the restructured TC MOP are posted to the TC page of the website (www.ashrae.org/TCs)

B. VIRTUAL ANNUAL MEETING

1. Training Options

i. TC/TG/TRG/MTG Chair's Training Topic - "There is Change in the Air "

The training is part of TC Chair's Breakfast virtual meeting. Draft slides sent via email.

ii. RAC's Research Subcommittee Chair's Breakfast

RAC has scheduled section Research Subcommittee Chair Breakfasts in July. See www.ashrae.org/conferences/ashrae-2020-virtual-conference for schedule details or below for details. Contact meetings@ashrae.org to request access to this meeting as a guest by close of business the day prior to the meeting.

Please encourage your Research Subcommittee Chair or another representative from the TC to attend this meeting so that your RAC Research Liaison (RL) can get an update on the TC's research activities and so that your RL can help resolve issues & questions that TC may have concerning their research program.

Announcements & Reminders for TC/TG/TRG & MTG Chairs Virtual Annual Meeting 2020

iii. **TC Program Subcommittee Chair Training**

Tuesday, July 7th, 1:00 PM – 2:00 PM EDT. Contact meetings@ashrae.org to request access to this meeting as a guest by close of business the day prior to the meeting.

A few things you might learn in training are as follows:

- Incomplete program submissions is the biggest reason for rejection now. All information is needed up front for CEC selection process.
- A packaged session on a similar topic is the best way to greatly improve your chances for acceptance.
- There is no difference in how CEC handles 60 and 90 minute program slots. 60 minute slots are just as good as 90 minute slots if complete.

C. **UPCOMING DEADLINES**

1. **TC Activity Forms for the 2020 Virtual Annual Meeting are due to Your Section Head before Tuesday 7/21/2020**

TC/TG/TRG Activity Feedback Form (Excel) can be downloaded from the TAC Section and TC Leadership Basecamp - www.ashrae.org/standards-research--technology/technical-committees/tc-forms-and-documents. Section heads can also provide an electronic copy of the form if requested.

2. **Seminar and Forum proposals for Chicago are due by Monday, August 3, 2020.**

Please visit the following site to submit your proposal:

For more information, go to: www.ashrae.org/chicago

3. **2020-2021 Hightower Award Nominations by Tuesday, September 1st**

TAC wishes to encourage TCs to make nominations for the 2020-2021 *George B. Hightower Technical Achievement Award*. Nominations are due to Section Heads by September 1, 2020 or sooner. The award recognizes outstanding technical leadership and contributions on a TC/TG/TRG during the past four years, excluding research and standards activities. Please go to the Technical Committee page of the ASHRAE website at the following link under the "Procedures, Forms..." heading:
<http://www.ashrae.org/tcs>

D. **REMINDERS**

1. **20-21 Roster Rollover**

Remember, the current 2019-2020 roster for your TC, TG or MTG is in effect until after they meet for the ASHRAE Virtual Conference. Rosters will roll over to 2020-2021 at that point.

2. Useful TC/TG/TRG/MTG Chair Information and forms on ASHRAE website

Information for TC/TG/TRG and MTG chairs can be found on the Technical Committee page of the ASHRAE website at the following link: <http://www.ashrae.org/tcs>

3. Request for each TC to briefly review ASHRAE Code of Ethics at start of meeting

See the following link for the latest version of the ASHRAE Code of Ethics:
www.ashrae.org/about-ashrae.

4. Make a Special Effort to welcome new Members, and Visitors to TC meeting

Potential new members for your committee have been encouraged to drop-by your meeting. As a result, please make a special effort to recognize and warmly welcome all visitors to your meeting – A TC can never have too many willing and able volunteers.

5. Is Your Committee Website up to Date?

If not, please ask your webmaster to at least post the latest minutes and the Kansas City meeting times and agenda. If your website has been neglected, add an action item for this meeting to appoint a responsible member of the TC/TG/TRG who will bring it back to life. The new TC website template has greatly simplified the duties of the TC webmaster and this form of communication is critical to the efficient operation of your committee, and for attracting new members. Please note a listserv is available to TCs to communicate with rostered members and all interested in keeping track of TC activities.

The recent conversion to a new TC website platform highlighted a couple areas where a refresher of the ASHRAE rules on website maintenance is warranted. First be aware that ASHRAE Products (i.e., handbook chapters, journal articles, final reports from research projects, etc.) cannot be published on your TC's website. It is very appropriate to post the title and scope of the product and then link the reader to the ASHRAE bookstore or other location on the ASHRAE site where the product may be purchased. Any possible exceptions to this rule must be sent through Mark Owen for review and approval (mowen@ashrae.org). The second issue involves timely posting of the draft minutes. Draft minutes (and final, approved minutes from the prior meeting) should be posted to your website (or otherwise distributed to the members) within 60 days after the meeting. Please ensure that your secretary and webmaster are aware of this deadline. To assist your secretary in understanding the procedures for taking and reporting minutes, a video has been developed and posted on the Technical Committees' Training page <http://www.ashrae.org/tcs>). On the same page, a video has also been posted for use by webmasters to learn about the procedures and schedule to maintain the new websites.

6. TC Master Calendar – Now Available through Google - The Technical Committee Master Calendar is now available through Google. In order to access this calendar you need to have a Google account.

Once you log into your Google account, follow the instructions below:

To add a friend's calendar, just follow these steps:

Announcements & Reminders for TC/TG/TRG & MTG Chairs Virtual Annual Meeting 2020

- At the bottom of the calendar list on the left, click Add and select Add a friend's calendar.
- Enter the appropriate email address (techservices1791@gmail.com) in the field provided, then click Add.

This calendar is public and will appear under 'Other Calendars' in the left column.

To set up Google Calendar Sync to your Outlook:

- Make sure you're using a supported operating system and Outlook version.
- Download Google Calendar Sync (version 0.9.3.6) at
- http://dl.google.com/googlecalendarsync/GoogleCalendarSync_Installer.exe
- Once a dialog box appears, click Save File. The downloaded file should open automatically. If it doesn't, manually open it from your browser's download window.
- Click OK to confirm that you're aware this is an executable file.
- Read through the Google Calendar Sync Terms of Service, and click I Agree.
- Follow through the Installation Options and click Install to finish the set-up process.

Once Google Calendar Sync is installed on your computer, the Google Calendar Sync Settings window will appear:

In the Settings window, enter your email address and password and select the Sync Option you prefer. Read about each Sync Option.

You'll also be able to set the time interval for syncing to occur. Please keep in mind that 10 minutes is the minimum time interval allowed.

After the initial set-up, you can access the Google Calendar Sync Settings window again by double-clicking the calendar icon in your Windows System Tray.

9. TC E-mail Position Aliases available

SY 19-20 TC Position e-mail alias addresses for the mandatory positions of the Technical Committee management team (Secretary, Standards Sub. Chair, Program Sub. Chair, Handbook Sub. Chair, and Webmaster) will stay in effect until July 22nd. The 19-20 E-mail Alias list with these position aliases is posted on the ASHRAE website www.ashrae.org/TCs under the heading *Procedures, Forms & Information for TCs/TGs/MTGs and TRGs*.

10. Restructured TC MOP (Manual of Procedures)

TAC has restructured the TC MOP so that it is easier to navigate and find information. The new TC MOP can be found on the ASHRAE website www.ashrae.org/TCs under the heading *Procedures, Forms & Information for TCs/TGs/MTGs and TRGs*.

11. Distribution of TC minutes changed in TC MOP

The TC MOP and *TC/TG/MTG/TRG Minutes Cover Sheet* form have both been updated and you are no longer required to send the TAC chair a copy of your minutes after each meeting. The new minutes cover sheet can be found on the ASHRAE website

Announcements & Reminders for TC/TG/TRG & MTG Chairs Virtual Annual Meeting 2020

www.ashrae.org/TCs under the headings *Procedures, Forms & Information for TCs/TGs/MTGs and TRGs – Routine Forms for TC/TG/MTGs/TRGs*.

12. Updated TAC Presentation Template Available for TC members to use with local Chapter

TAC recently updated the standard presentation and presentation notes that TC members can use, without a lot of effort, to explain what TCs do for the Society and how that work benefits members in your local ASHRAE Chapter.

The new presentation and presentation notes files are posted now at the following link www.ashrae.org/tcs under the heading *General TC Information* at the top of the page in case you prefer to direct others to these files posted online. The presentation material is now also available in both English and Spanish.

13. Basecamp Information from ECC

More and more TCs and standing committees are making use of ASHRAE's subscription to Basecamp3 to better organize, store, and distribute on-line committee files that are needed for their meetings through a dedicated committee Basecamp site. If you would like to learn more about Basecamp and how to request a site for your particular committee, please go to the Electronic Communications Committee (ECC) web page: (<https://www.ashrae.org/communities/committees/standing-committees/electronic-communications-committee>) and scroll down to the section titled *Basecamp Guidance*

E. RECENT ANNOUNCEMENT

1. CEC's Standing Request for Future Society Meeting Program Track Suggestions

The Conferences and Expositions Committee (CEC) oversees ASHRAE's annual and winter conferences and other specialty conferences and expositions globally. The CEC continually works to improve the conference experience for all attendees. To help keep a "pulse" on the technical issues facing professionals in the HVAC&R marketplace, and to create meetings that reach all of ASHRAE's constituencies, the CEC seeks ideas for tracks for the Chicago 2021 Winter meeting and annual and winter conferences beyond as well as topics for specialty conferences from TC members.

Please submit your suggestions to ASHRAE Staff member Tony Giometti (Giometti@ashrae.org). You can also add your track suggestion in the "Comment" section of the TC Activity form for the Orlando meeting.

2. CEC Always Seeks TC Volunteers willing to Support Content Development and Quality Control for Society Technical Program at Society Meetings

Provide to your Section Head after each Society meeting a list of qualified volunteers from your TC that are potential Technical Session chairs and reviewers of session papers that are related to TC's scope for use by the Conferences & Expositions Committee (CEC) in developing technical content for future technical programs.

3. The Professional Development Committee (PDC) is seeking ideas for new ASHRAE Learning Institute (ALI) courses.

The Professional Development Committee (PDC) is actively seeking ideas for new ASHRAE Learning Institute (ALI) courses. We need practical courses of broad interest to be presented as face-to-face seminars or short courses, instructor-led online courses and self-paced courses. Examples include courses with a focus on new technologies that need to be shared, fundamentals for engineers new to the discipline, standard applications that need explanation, and courses based on new design guides. Does your TC have a potential course idea?

Contact Karen Murray (ASHRAE staff) kmurray@ashre.org or PDCchair@ashrae.net with your course ideas.

4. ASHRAE Certification Committee seeking ideas from TCs for possible professional certification programs

Certification Committee seeking ideas from TCs for possible professional certification programs related to 1) support adaptability, resilience and recovery of buildings and communities, 2) promote understanding of indoor environmental quality (IEQ) among practitioners). Representatives from the Certification Committee will meet with TCs in Orlando that expressed an interest or had ideas.

F. CURRENT & UPCOMING ASHRAE CONFERENCE PROGRAMS

1. Austin Annual Conference - June 27 – July 1, 2020

Conference Website: www.ashrae.org/austin

Conference Program Chair: Bing Liu

Program Focus at Austin Annual Conference:

- i. Track 1: Fundamentals and Applications
- ii. Track 2: HVAC&R Systems and Equipment
- iii. Track 3: Research Summit
- iv. Track 4: Professional Development
- v. Track 5: Grid-Interactive Efficient Built Environment
- vi. Track 6: Multifamily and Residential Buildings
- vii. Track 7: Resilient Buildings and Communities
- viii. Track 8: Zero Energy Buildings and Communities: Opportunities and Challenges

2. Chicago Winter Conference – Jan. 23 – Jan. 2, 2021

Conference Website: <https://www.ashrae.org/chicago>

Conference Program Chair: Maggie Moninski

Program Focus at Chicago Winter Conference

- i. Track 1: HVAC&R Fundamentals and Applications
- ii. Track 2: Systems and Equipment
- iii. Track 3: Refrigeration & Refrigerants
- iv. Track 4: Environmental Health through IEQ
- v. Track 5: Building Performance and Commissioning for Operation and Management
- vi. Track 6: Energy Conservation
- vii. Track 7: International Design
- viii. Track 8: Standards, Guidelines and Codes
- ix. Track 9 (mini-track) based on Chuck Gullledge's Presidential Theme (to be announced and not accepting papers).

G. OTHER UPCOMING WORKSHOPS, CONFERENCES AND EVENTS

1. 2020

- i. 2020 Building Performance Analysis Conference & SimBuild Co-organized by ASHRAE and IBPSA-USA – August 12-14, 2020 – Chicago, IL - www.ashrae.org/conferences/topical-conferences/2020-building-performance-analysis-conference-simbuild (Virtual Conference)
- ii. IAQ 2020: Indoor Environmental Quality Performance Approaches: Transitioning from IAQ to IEQ – September 14-16, 2020 – Athens, Greece - www.ashrae.org/iaq2020
- iii. 4th International Conference on Efficient Building Design: Materials and HVAC Equipment Technologies – October 1-2, 2020 – Beirut, Lebanon – www.ashrae.org/beirut.
- iv. Indoor Air 2020: Creative & Smart Solutions for Better Built Environments – November 1-5, 2020 Coex, Seoul, Korea - <http://indoorair2020.org/>.

2. 2021

- i. AHR Expo 2021 – January 25-28, 2021 – Chicago, IL - <https://ahrexpo.com/>

Announcements & Reminders for TC/TG/TRG & MTG Chairs Virtual Annual Meeting 2020

- ii. Ventilation 2021: 13th International Industrial Ventilation Conference for Contaminant Control – August 15-18, Toronto, Canada - www.ashrae.org/conferences/topical-conferences/ventilation-2021.

APPENDIX C

TC 9.6 Handbook Subcommittee



TC 9.6 Handbook Subcommittee Meeting (2023 Applications – Health Care Facilities)

Friday June 19, 2020

10am-1pm Started ~11:40am, ended 12:22 pm

| Item | Description | Person | Time |
|------|--|-------------|------|
| 1 | Welcome | P. Likhonin | 2 |
| 2 | Introductions and Sign-in Link: https://form.jotform.com/201688427015152 | All | 5 |
| 3 | Schedule for 2023 Applications | P. Likhonin | 5 |
| 4 | ASHRAE Authoring Portal – Chapter Location | P. Likhonin | 5 |
| 5 | Task List | All | 15 |
| 6 | Discussions/New Business | All | 5 |
| 7 | Adjourn/Next Meeting | P. Likhonin | 3 |

Intro:

- Video feeds off
- Update names on zoom (First Name Last Name)
- Mute unless you're speaking
- Sign in via link: <https://form.jotform.com/201688427015152>
 - Select Handbook

Schedule:

- Review of current handbook is due on July 1, 2020 for identifying changes to be made.
 - May 10, 2022 final due to society.
 - Schedule Attachment

ASHRAE Authoring Portal:



-
- Have all volunteers signed in?
- Go over the ASHRAE Authoring Portal
 - <https://authoring.ashrae.org>
 - Only available in IE, doesn't work on any other explorer....
- Ongoing re-organization of sections.

Task List:

- Google Docs Spreadsheet
- Identify additional sections to revise
- Workgroup meeting via MS Teams Monthly.
 - Monthly 1 hr work sessions

Discussions/New Business:

- Pandemic section

Zoom Meeting Minutes:

Introductions: 43 participants via sign in, more on actual zoom.

1. Schedule (Major Milestones):
 - a. Identify Revisions to be done by July 1, 2020
 - b. Select Working Group to lead revisions identified by Feb 1, 2021
 - c. Revise Chapter by Feb 1, 2022
 - d. Send Chapter to TC to review and Vote by March 25, 2022
 - e. TC to vote by April 10, 2022
 - f. Send Chapter to HBC Liaison by May 10, 2022
2. Went over handbook chapter review form and requested feedback for areas to edit.
3. ASHRAE Authoring Portal access and showing how to use.
4. Went over current task list and assigned new volunteers



5. Each task list was assigned a lead and sections were split up for individual work sessions.

6. Meeting Adjourned at 12:22

Chat from Zoom:

From David Eldridge - Voting Member : Reminder to use the online sign-in sheet if you haven't already. Update: you can select multiple meetings today for the TC if you will be at more than one subcommittee and main meeting.

<https://form.jotform.com/201688427015152> - it may be possible to edit your previous entry, or feel free to submit a new one for each subcommittee. Reports are that internet explorer is a little iffy - email your attendance instead if Jotform not working.

10:19:53 From Dan Koenigshofer : did you say voting members don't need to sign-in?

10:20:23 From Pavel Likhonin : all members need to sign in

10:20:56 From Pavel Likhonin : all attendees*

10:22:58 From Kishor Khankari : RTAR is a simple document. Efforts should be placed on convincing on the importance of the topic rather than on technical approach and budget.

10:23:36 From Kishor Khankari : What are actions items?

10:26:41 From Kishor Khankari : For ASHRAE members ASHRAE research reports are free to download. Good database is available on portal

10:29:07 From Kishor Khankari : There is no mixing factor. It is unique to each situation.

10:29:55 From Kishor Khankari : Ventilation effectiveness is important that's why there is no K Factor.

10:30:36 From Kishor Khankari : Several people have chased this K in the past without much success.

10:32:01 From Kishor Khankari : $C = G/Q$ for perfect mixing. $C = K G/Q$ for imperfect mixing.

10:36:25 From Kishor Khankari : C = concentration, G = generation rate, Q = supply airflow rate



ASHRAE TC9.6 HANDBOOK SUBCOMMITTEE MEETING AGENDA

10:39:15 From Kishor Khankari : Disagree that one CFD analysis might not be applicable to other similar situation. Lessons and insights gained from a Physics based analysis can be applicable to other similar situations. Dilution K factor does not have any sound scientific basis.

10:41:57 From Linda Lee : Erica did you say that was 6.1?

10:42:16 From Erica Stewart : 62.1 IAQ

10:45:18 From Pavel Likhonin :
<https://form.jotform.com/201688427015152>

10:46:58 From ken mead : If using Internet Explorer, may not work

10:51:06 From Rick Hermans : I have to drop off for a Epidemic Task Force meeting.

10:54:13 From Duncan Curd : Happy to help with ENergy

10:55:25 From Duncan Curd : Also happy to help with this section

10:55:41 From Kapil Mehrotra : I am Kapil Mehrotra attending this TC first time . I am an ASHRAE member and past president India Chapter and happy to volunteer wherever required.

11:04:11 From Erick Phelps : I have to jump off for another call

11:08:21 From Gina Semerad : If you need more volunteers, I can help with the COVID-19/ epidemic section. My company is based on NYC and I was directly involved in the effort for 5 separate campus responses and helped indirectly supported several other locations (including the armycorp work).

11:08:22 From Tom Parker : Happy to volunteer for the resiliency section and Pandemic planning as well

11:09:32 From Juli Johnson : I am new to the TC and I'll volunteer to help but as I'm not plugged in yet I would probably best used in a supporting role.

APPENDIX D

TC 9.6 Research Subcommittee

ASHRAE TC9.6 Research Sub-Committee Meeting

June 19, 2020

Overview – Meeting Minutes

- 45-50 attendees
- Great volunteer response! Duncan, Alejandro, Gina, Jonathan, Erica, Kapil, Jeff, Kathleen,
- Reviewed following slides
- New Research Ideas
 - Room construction tightness – for FGI?
 - IAQ post-occupancy
 - Mixing/dilution
 - Ionization/UV efficacy

Overview – Meeting Minutes

- Action Items
 - Support WS1864
 - Determine priority/order/strategy of research focus of TC9.6
 - Engage volunteers

Welcome!

- Introductions
 - David Thomsen; david.thomsen@providence.org
- Monitoring Chat, Sign-in “sheet”:
 - <https://form.jotform.com/201688427015152>
- Appendix includes links to home page and books store, other notable ASHRAE research efforts, flow chart of ASHRAE research process
- Agenda –
 - TRTAR, Open Discussion/Brainstorming
 - Reports – KP CEC, ACR MTG, Research Projects, TRP, WS, TWS, RTAR,

Tentative RTARs

- CO-RP 3: Literature Review of ASHE/ASHRAE Standard 170 Suggestions
 - Thermal Comfort Clo (RP1760) and Met Values (costly)
 - Separation Distances
 - RP 1635 recently published.
 - Impact of Door Opening on Pressure Differentials
 - Volunteer?
 - Big Data Operating Room Air Change Analysis
 - Tie-breakers
 - Cost Benefit Analysis
 - Ventilation Rate Procedure for Contaminant Exposure (WS 1864)

Tentative RTARs

- Rick Hermans Search for Minimum Protection
 - Goal 1) Healthcare Air Contaminants
 - Goal 2) Air Contaminant Concentration Maximums to Acceptable Contamination Levels
 - Goal 3) Contaminant Sources and Dispersion Within Spaces
 - Goal 4) Patient Comfort as Determined by CLO and MET (see above)
 - Goal 5) Differences, Similarities Between Ambulatory and Non-Ambulatory Clinical Care
- Rick Suggestions COVID
 - Forthcoming

Tentative RTARs

- ASHRAE Position Document on Infectious Aerosols Suggestions
 - Investigating and developing source generation variables for use in an updated ventilation rate procedure (WS 1864?)
 - Understanding the impacts of air change rates in operating rooms on patient outcomes
 - Determining the effectiveness of location of supply, return, and exhaust registers in patient rooms
 - Conducting controlled interventional studies to quantify the relative airborne infection control performance and cost-effectiveness of specific engineering strategies, individually and in combination, in field applications of high-risk occupancies
 - Evaluating and comparing options to create surge airborne isolation space and temporary negative pressure isolation space and the impacts on overall building operation
 - Understanding the appropriate application of humidity and temperature control strategies across climate zones on infectious aerosol transmission
 - Investigating how control banding techniques can be applied to manage the risk of infectious aerosol dissemination

Tentative RTARs

- Urgent Care infection risk
- Aerosol generating procedure.
- HEPA filter location for OR's.
- Effectiveness of 188
- Relative Humidity
 - Traci expressed interest in developing
- RH vs wetted contact time for hospital disinfectants
 - Walt Vernon mentioned his involvement with Health Care Institute (HCI) and International Federation of Healthcare Engineers (IFHE). [Walt serves on HCI board and Sees opportunity for HCI/IFHE/ASHRAE research collaborations.]

Open Discussion/Brainstorming - Volunteers

Reports

KP research funded by CEC

- Presentation by Travis English in January
 - <https://www.youtube.com/watch?v=6LMeNY9iQiQ>
 - Highlights (Phase 2 - CAV to VAV, minimum per CMC Table 4a/170)
 - Filtration has big impact
 - Low load in patient rooms
 - 2-12 ACH have little difference
 - Clean and Dirty have little difference
- Phase 3 (IAQ ventilation, minimum to 62.1 for admin spaces)
- Draft report due end of July
- Final report due end of September
- Presentation in January 2021?

1833 RP: Literature Review for Evidence of the Basis for Specified Air Change Rates (ACR) for Cleanrooms, Laboratories, and Healthcare Facilities with medium to high ACR.

- Lead Air Change Rate (ACR) MTG: Kishor Khankari
- TC9.6 Contacts/PMS: Roger Lautz, Ken Mead, Mike Meteyer, Travis English
- Research Objective: Evaluate ASHRAE ACR Guidance and determine if it is research-based and whether the ACR approach is the most appropriate design/control approach for the design space. Similar to CO-RP 3 and with obvious overlap yet it applies to spaces beyond healthcare and may include evaluations of the appropriateness of ACR as a design/control aspect not included in CO-RP 3
- Update – Roger/Kishor

RP-1760: Update of clothing database for existing and new Western clothing ensembles, including effects of posture, body and air movement

- Lead TC2.1: Dennis Loveday, Ron Westbrook, TC9.6 Contact/PMS: Mike Meteyer
- Research Objective: Evaluate CLO Values
- TC2.1 agreed to amend contract to included defined set of healthcare attire: OR patient, within sterile OR, outside sterile OR, sterile processing decon, sterile processing distribution, isolation room; working on laboratories.
- Missing some PPE and labs were shut down due to COVID. Researchers are publishing non-medical work and received extension to finish medical work once missing ensemble parts and labs are available.
- Update – Mike

RP-1816: Reporting the Energy Use and Heat Gain from Imaging Equipment

- Lead TC9.6: Oscar Cobb PMS Chair; TC4.1 and TC4.7 Co-sponsored
- Research Objective: This research will determine heat gain and energy use for large, often multi-component, imaging systems in the field. Results will be used to update and expand current data in multiple ASHRAE publications. It will also provide energy use metrics for energy modeling and medical equipment comparisons in HVAC designs.
- PMS meeting 6/17, approximately 6 month delay due to COVID
- Update – Oscar

RP-1780: Test method to evaluate cross-contamination of gaseous contaminant within total energy recovery wheels.

- Lead TC 9.10 (Laboratory Ventilation); TC 9.6 Lead/PMS: Brendon Burley
- Awarded and first meeting was 6/18
- Update - Brendon?

Work Statement

- 1864 WS: Investigating the applicability of Standard 62.1's Ventilation Rate Procedure for Healthcare Rooms
 - TC9.6 Lead: Paul Ninomura; Co-Sponsor: SSPC 170
 - Research Objective: ASHRAE Standards 62.1 and 170 seek to provide safe and acceptable indoor environments yet they employ very different approaches. This research investigates if/where the design flexibility in Standard 62.1's Ventilation Rate Procedure could be an appropriate and energy-conserving alternative to Standard 170's prescriptive air-change-per-hour approach to outdoor air ventilation requirements.
 - Ken authored RTAR with Paul assisting, Paul is guiding the RTAR for SSPC170.
 - RAC liaison approved RTAR; comments received will be addressed in WS
 - Ehsan and Kishor offered to review.
 - Update – Paul/Ken.

Work Statement

- 1873 WS: UVGI Design Applications for Large Volume Spaces
 - Lead TC 2.9: Steve Martin; TC9.6 Lead: Ken Mead
 - Research Objective: Current system design guidance is based on room square footage. High-ceiling rooms are thus penalized causing potential over-design and inflated first and operating costs. Objective is to conduct research to ID if floor area design approach would be equally effective at airborne pathogen deactivation
 - Approved RTAR with comments in Atlanta
 - Addressing comments with Liaison
 - Hoping for renewed effort
 - Bob Cox offered to help.
 - Update – Ken

Tentative Work Statement

- 1889-TWS: Graywater use in Healthcare Facilities; determining risk and appropriate design responses
 - Lead 189.3: Mikhail Fuks; TC9.6 Lead: Eric Granzow
 - Research Objective: Determine if any negative impacts to patient safety may exist from use of non-potable water.
 - Update – limited progress due to COVID

Tentative Work Statement

- 1854 RTAR: Database of Ultraviolet Inactivation Rate Constants (k-values) for Microorganisms Critical to System Design
- Lead TC 2.9: Steve Martin; TC9.6 Lead: Ken Mead
- Research Objective: Literature review and development of a comprehensive and standardized database of UV rate constants (susceptibility to UV) of various micro-organisms in air and surfaces in the built environment.
- Submitted to RAC shortly after Atlanta
- RAC to review
- Update – Ken
- Approved?

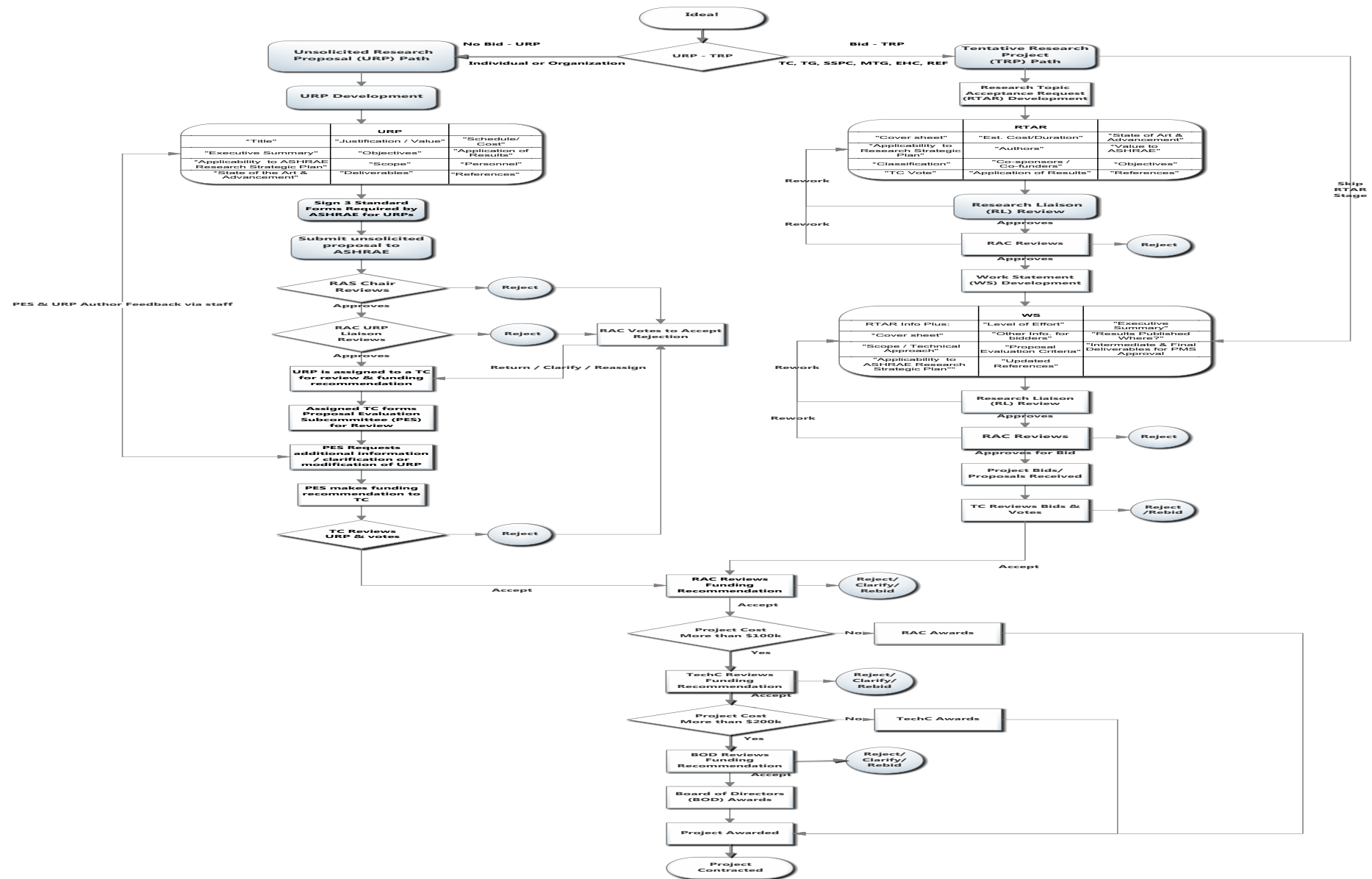
RTAR

Appendix

- ASHRAE Research Home page –
 - <https://www.ashrae.org/technical-resources/research>
- Purchase Research Reports –
 - https://www.techstreet.com/ashrae/subgroups/34748?ashrae_auth_token=
- Research Flowchart –

Other research efforts

- 1837 RP: The effects of ventilation in sleeping environments
- 1817 TRP: Long-term Temperature Change of Ground Heat Exchangers
- 1835 TRP: Characterizing the Performance of Entrained Flow Stacks
- 1850 TRP-C: Evaluation of ASHRAE's Design Day Procedure Against Recorded Weather Data
- 1852 TRP: Develop Performance Metric, Criteria, and Process to Measure and Predict Speech Privacy in High Performance Buildings
- 1858 RTAR: Evaluation of HVAC ventilation effectiveness in reducing semi-volatile organic compounds in indoor spaces
- 1888 RTAR: Maximizing efficiency of energy conversion technologies of buildings via energy based analysis
- 1890 RTAR: Minimum flow velocities for purging air and debris from hydronic piping systems



APPENDIX E

TC 9.6 Infectious Diseases Subcommittee

TC 9.6 Infectious Disease Subcommittee

Meeting Report: 19 Jun 0800-1000



1. **Attendees were welcomed and provided special sign in instructions:**
2. **Approx: 55 attendees documented**
3. **Introduction exercise:**
 - a. On Zoom: To avoid confusion, edit your display name by hovering over it and clicking Rename
 - b. TC Chair, subcommittee chair, longest member, newest member, visitor, yea member
 - c. Name, city, work affiliation, work focus (student, designer, researcher, owner, consultant, academic, equipment manufacturer, ...)
4. **ASHRAE Infectious Aerosols Position Document** – Erica Stewart – Kaiser Permanente
 - a. Completed: April 14, 2020. Expires April 14, 2023.
 - b. Available at:
https://www.ashrae.org/file%20library/about/position%20documents/pd_infectiousaerosols_2020.pdf
 - c. Next committee forming now, reconvening early, coordinated from EHC.
5. K. Mead: **“The Control of Infectious Aerosols Using Air Exchange, Filtration and Source Control”**. Presentation/discussion from COVID-19 webinar sponsored by The American College of Medical Toxicology & others. Overview of infectious aerosol control and related government websites. [see attached list of websites]
6. Alejandro Falcón Bonilla - Presentation: **“LESSONS LEARNED FROM MERS TO COMBAT SARS-COV2 IN UAE”**
7. Steve Friedman – Memorial Sloan Kettering Cancer Center, New York: Presentation: **Risk Mitigation Strategies for MEP Healthcare Infrastructure - Pandemic Preparedness** – (presentation moved to main TC meeting due to time constraints)
8. **Other Activities/Lessons Learned:**
 - a. Paul Supan – Dental Subcommittee – Epi Task Force (see attached 1-page summary)

TC 9.6 Infectious Diseases Sub-Committee Zoom Conference Friday June 19, 2020 American Dental Association Update

Recent Activity

The ADA's Covid Task Force had a teleconference on June 3, 2020. The ADA reaffirmed their interest in ASHRAE's expertise. The Association seeks to learn more about HVAC guidelines and engineering recommendations to help the over 200,000 dentists in the US workforce achieve a safe dental environment in this age of Covid.

Current Issues

The ADA's questions largely focused on managing bio-aerosol contamination. Curating the many questions into five main categories results in the following:

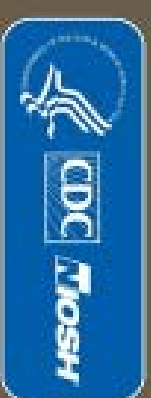
- Are Positive/Negative Pressure rooms appropriate /practical in a private practice Dental Office?
- What current UV technologies can be practically implemented into HVAC systems, ceilings, and elsewhere to help address airborne aerosol and surface contamination?
- Can portable air cleaners with multistage HEPA filters and UVC sufficiently reduce the airborne Covid bio-aerosols in a dental treatment room?
- How does a dental office address airflow without redoing the entire HVAC system?
- Are ozonation and photocatalytic technologies an appropriate adjunct to address airborne bio-aerosols?

Actions

To address these types of questions, ASHRAE, under TC 9.6, recently established a Dental Environmental Task Group (DETG). The Task Group currently has three dentists and five ASHRAE Engineers. The DETG is also reaching out to TC 2.9 (UV) and the SSPC 52.2 Particles Group for MERV and Electrostatic Precipitation of Particles (ESP) expertise.

The DETG is also working to add content to several pages which will appear on the Epidemic Task Force section of the ASHRAE.org website. The DETG has a working standard A3 template to help ensure a consistent appearance.

The DETG is developing content for the webpage, including relevant links. A FAQ section is also being developed. The DETG and the ADA will continue to expand their working relationship, as this may prove to be a long term activity. An ADA SWOT (Strengths Weaknesses Opportunities Threats) analysis lists the Association's relationship with ASHRAE as an important strength. The ADA seeks to raise awareness of ASHRAE in the dental community. The ADA website will include links back to ASHRAE.org



Some Links of Interest

1. Everything COVID:
<https://www.coronavirus.gov/>
2. Hierarchy of controls:
<https://www.cdc.gov/niosh/topics/hierarchy/default.html>
3. Aerosol settling:
https://www.cdc.gov/niosh/topics/aerosols/pdfs/Aerosol_101.pdf (slide 12)
4. ACH vs Time-to-purge Table:
<https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#tableb1>
5. Source Control:
<https://blogs.cdc.gov/niosh-science-blog/2020/04/14/ventilated-headboard/>
6. Master Question List (DHS):
<https://www.dhs.gov/publication/st-master-question-list-covid-19>

Non-governmental Healthcare Engineering Resources: www.ashrae.org , www.ashe.org , ...

APPENDIX F

TC 9.6 Main Meeting Presentation Slides by Steve Freidman

Risk Mitigation Strategies for MEP Healthcare Infrastructure

Pandemic Preparedness

04.17.2020

Steven Friedman, PE, CHFM, HFDP, LEED AP

Director, Facilities Engineering Design & Construction

Facilities Management Division

friedmas@mskcc.org



Memorial Sloan Kettering
Cancer Center



Memorial Sloan Kettering
Cancer Center

The Healthcare Facilities Engineering Playbook

Key Facility Drivers

- * System Reliability & Functional Testing
- * Geographic Resiliency
- * System Capacity
- * Redundancy (N+1)





Mechanical & Electrical System Specifics :

1. Normal and Emergency Power Distribution
 - power panels for landing circuitry wires
 - strategic locations to connect additional utilities
2. On-Site Energy Sources
 - Emergency Generators, Boilers and Domestic Water system feeds
 - Roll Up Trailer – supplemental fuel oil tank, skid & pump sets
3. Medical Gas Distribution
 - Connection points for added equipment & ventilators
 - Check attic stock- Ex: PRV's, gas regulators & alarm switches
 - Bulk Oxygen farm distribution freeze-up (demand)
4. Domestic Hot Water Distribution, Water Treatment Management & Point of Use
 - Increase demand-hand washing & showering
 - Remote bed locations – potable hand wash sinks



Mechanical & Electrical System Specifics :

5. Refrigeration (DX or Chilled Water)
 - Can you be ready for a “once through” airside scenario?
 - Shedding non-essential load to meet demand
6. Humidification
 - Operationalize AHU and localized humidification systems
 - Promoting patient healing with 40-60% RH in occupied spaces
7. Building Automation, Information Technology, & Wi-Fi Capacity
 - BAS must be capable of system(s) control
 - Robust IT backbone- Patient file access
 - Wi-Fi capabilities for remote temporary facilities



Mechanical & Electrical System Specifics :

8. Ventilation, Contamination and Filtration Systems

- Ability to provide 100% outdoor air (SA/RA/EA damper control)
- Retrofit AHU's with 99.97% HEPA Filtration
- Retrofit AHU's of UVGI lights- "Slayer of Airborne Pathogens"
- Common paths of airside delivery – Variable Air Volume (VAV) and Constant Volume (CV)
 - ❖ Creating Positive and Negative pressures within program spaces
 - ❖ Regulating facility wide general exhaust systems
 - ❖ Localized HEPA filtration within patient rooms and ICU's



Future Healthcare Facility Design Considerations

1. Consider building wide exhaust air capacities to meet or exceed your supply air quantities
2. Consider VAV/CV air distribution "tracking pair" design for clinical areas
3. Consider flow distribution flexibility for your chiller plant in both series and parallel configurations
4. Consider the methodology to add temporary medical gas equipment to your existing distribution
5. Consider adding spare electrical distribution placed strategically for roll up equipment support
6. Ensure robust electrical infrastructure for your information technology and communication systems
7. Consider your major energy movers and energy sources to be **ABOVE** potential flood elevations