

Draft Minutes - Main Committee Meeting

TC 2.4 Particulate Contaminants/Removal Equipment

Tuesday January 27, 2015
3:30-6:00 pm
Palmer House Hilton, Chicago

1. TC Chair Tom Justice called the meeting to order at 3:35 pm.
2. Attendees introduced themselves. About 66 people were in attendance including 26 Corresponding Members (CM) and 22 guests. Section 2 Head Tom Sobieski was present but had no messages for the TC. There were no other liaisons present.
3. Secretary Gemma Kerr distributed sign-up sheets, and made the roll call of Voting Members. All eighteen VM were present. Quorum for this committee is ten VM. VM attendance and Non-Voting Member responsibilities are shown below.

Voting Member	Pres	Abs	Voting Member	Pres	Abs	
Tom Justice (Chair)	X		Kathleen Owen	X		
Eric Brodsky (Handbook)	X		Jeff Siegel (Non-Quorum)	X		
Keith Chesson	X		John Simenson	X		
Mike Corbat (Standards)	X		Brent Stephens	X		
Zied Driss	X		Christine Sun	X		
Randy Haseman	X		Paolo Tronville	x		
Tim Johnson	x		Al Veeck (Membership and Webmaster)	X		
Gemma Kerr (Secretary)	X		Mike Waring (Research)	X		
Brian Krafthefer	X					
Bruce McDonald	X					
Totals				18	0	18

Non-Voting Officers

Don Thornburg (Vice Chair)
Marilyn Listvan (Program and Publications Chair)
Barney Burroughs (ALI Coordinator)

4. Tom Justice welcomed everyone to the meeting and delivered his opening comments.
 - a. The Agenda, which had been circulated before the meeting, was accepted as distributed;
 - b. ASHRAE is asking people to pay attention to the Code of Ethics, see Attachment 1;
 - c. Tom said the subcommittee meetings that he attended were great, and that this fact made his job easy;
 - d. Use of webinars and conference calls made for a busy six months leading up to Chicago, and much was achieved. ASHRAE is continuing to promote web conferences/conference calls for TC

- Subcommittees to allow live discussions between Meetings. Requests to schedule them should be sent to Mike Vaughn;
- e. The deadline for program submissions for Atlanta is February 9. To improve chances of acceptance, please ensure the correct track is selected (contact Track Chair if unsure). Sub-committee Chair Marilyn Listvan can assist in reviewing submissions;
 - f. The Standards Sub-committee and the TC will vote in Atlanta on whether to approve development of a Method of Test (MOT) for residential filters;
 - g. The ISO TC 142 suite of 16890 Standards differs from ASHRAE Standard 52.2 in its approach to filter classification. This issue will need to be addressed by the TC at some stage;
 - h. Tom announced that Secretary Gemma Kerr will move directly to Chair after the Summer Meeting due to Don Thornburg's continuing commitment to ISO TC 142;
5. Keith Chesson announced that the Particle Party would take place at Pizano's Pizza and Pasta, 61 East Madison (a short walk from the Palmer House), starting at 6:30 pm. The total number interested was around 35, including people from TC 2.3.
 6. A motion to approve the Seattle Minutes as distributed was made by Al Veeck and seconded by Brian Krafthefer. The Minutes were approved by a vote of 13-0-3-1-18 (Yes-No-Abstain-Absent-Total), Chair Not Voting (CNV).
 7. Gemma Kerr read out the record of votes taken since the Seattle Meeting. They are shown below with vote details and date of completion:
 - a. The result of the e-mail ballot seeking approval to forward to the Research Activities Committee (RAC) Work Statement (WS) 1649 titled ***IAQ and Energy Implications of High Efficiency Filters in Residential Buildings*** was 15-0-2-1-18 (CNV) (December 15).
 - b. The final tally of the e-mail ballot seeking approval to forward to RAC the Research Topic Acceptance Request (RTAR) titled ***Evaluation of low-cost particle and CO2 sensors for Indoor Air Quality Monitoring in Smart Building Systems*** was 14-0-2-2-18 (CNV) (December 15).
 8. Subcommittee Reports
 - a. Planning Subcommittee Report Don Thornburg
 - i. The Planning Sub-Committee met 8-10 am Tuesday. The Meeting Minutes are shown in Attachment #2;
 - ii. This Sub-Committee focuses on how things are being done and how we can do better;
 - iii. Gemma Kerr has put together a draft "Road Map" to help the TC move forward and improve. It was discussed at the Planning Meeting and changes agreed. The new draft will be sent out to the TC for review;
 - iv. The Road Map emphasizes the importance of having a Vice Chair in place on all sub-committees, and having Liaisons identified who will attend other committee meetings and report back to the TC. Nominations agreed at the Planning Meeting are as follows:
 - Program Sub-committee Vice Chair: Donna Sullivan
 - Publications Sub-committee Vice Chair: Dara Feddersen
 - Liaison to Standard 62.2: Brent Stephens
 - Liaison to SSPC 52.2: John Zhang
 - Liaison to GPC 35: Brian Krafthefer
 - Liaison to ISO TC 142 US TAG: Matt Middlebrooks (Chair of the US Technical Advisory Group)
 - Liaison to ISO TC 142 Working Group (WG) 3: Tim Johnson

Liaison to ISO TC 142 WG 12: Dara Feddersen

Barney Burroughs offered himself as liaison to TG 2 (Building Security). He pointed out that the Environmental Health Committee also needed a liaison. Jeff Siegel volunteered to take this on;

- v. To encourage people to attend Sub-committee meetings, TC Chair Tom Justice would like Sub-committee Chairs to each submit to him a discussion hot topic to be included in the schedule of events that he sends out in advance of the Winter and Summer Meetings;
 - vi. It was suggested that the Research and Standards Sub-committees are sufficiently key that they need their own Road Map. Gemma Kerr will consult with the respective Chairs on this;
 - vii. Gemma Kerr proposed and Al Veeck seconded the motion to approve the Planning Subcommittee Report. The motion was carried by a vote of 17-0-1-0-18 (CNV).
 - viii. Don Thornburg called for a vote to approve the liaisons. Bruce McDonald proposed and Tim Johnson seconded a motion asking the TC to accept that having liaisons is a good idea. This was carried by a vote of 17-0-1-0-18 (CNV). Then Bruce McDonald proposed and Tim Johnson seconded a motion to approve the volunteers listed in the Planning report as official liaisons. This was carried by a vote of 16-0-1-1-18 (CNV).
- b. Membership Subcommittee Report Al Veeck
- i. Al welcomed first-time attendees to the TC meeting. Most were YEA members;
 - ii. Regarding current voting membership of the TC, Tom Justice, Michael Corbat, Jeff Siegel, Christine Sun and Al Veeck are rolling off after the Summer Meeting. Five new VM will roll on to keep the total number at 18. These have not yet been approved by ASHRAE;
 - iii. Mike Waring proposed and Brian Krafthefer seconded the motion to approve the Membership Subcommittee Report. The motion was carried by a vote of 17-0-1-0-18 (CNV).
- c. Research Subcommittee Report Michael Waring
- i. The Research Subcommittee met 3-5 pm Sunday with more than 60 people attending;
 - ii. The Meeting Minutes are shown in Attachment #3;
 - iii. News from the Research Chairs' breakfast was that ASHRAE currently has 59 active research projects worth a total of \$11M. There are no projects on hold due to lack of funds. There are several RTARs and Work Statements under review;
 - iv. The Sub-committee was active between Seattle and Chicago, which resulted in submission to RAC of WS 1649 and the RTAR on sensors (see record of votes taken above);
 - v. WS 1649 has been conditionally accepted by RAC. Some comments need to be addressed then the WS will go out to bid;;
 - vi. RTAR 1756 (sensors) has also been conditionally accepted. Comments need to be addressed, then a WS will be written
 - vii. 1691-URP on modeling the effects of particles is almost complete. A presentation was made by PI Brent Stephens to the PMS in Chicago, and the final report is being reviewed. Mike congratulated Brent on the prompt delivery;
 - viii. RTAR 1734 (urban aerosols) has been accepted as potentially useful by RAC after discussions with Mike Vaughn, and the team will move directly to writing a WS. The champions are Paolo Tronville and Jeff Siegel;
 - ix. Several other RTARs are in the writing process with possible submission in May. Details of these are in the Research Sub-committee Minutes;
 - x. Mike said that the outlook is good for future TC 2.4 research projects.
 - xi. Al Veeck proposed and Christine Sun seconded the motion to approve the Research Subcommittee Report. The motion was carried by a vote of 16-0-1-1-18 (CNV).
- d. Standards Subcommittee Report Michael Corbat

- i. The Standards Sub-committee meeting took place Monday 4:15– 6 pm;
 - ii. The Meeting Minutes are shown in Attachment #4;
 - iii. Standard 52.2's four recent Addenda are finally approved and ready for publication. Three new Addenda have been proposed, two related to reporting and one requiring full test completion for use of MERV. These will be voted on in Atlanta. A motion to make Appendix J mandatory was defeated;
 - iv. GPC 35 has now got volunteers started on writing the Guideline;
 - v. ISO TC 142 Standard 16890 (four parts) is nearing completion, and the 52.2 Committee needs to consider its position. The 16890 Standards use PM as a basis for filter classification rather than MERV, though the starting data are equivalent;
 - vi. Residential filters are receiving increasing attention. The Sub-committee will have a proposal for a new residential filter standard ready for Atlanta;
 - vii. Reports from other standards liaisons can be found in the meeting Minutes;
 - viii. A motion to approve the Standards Subcommittee Report was proposed by Bruce McDonald, seconded by Jeff Siegel and carried by a vote of 16-0-1-1-18 (CNV).
- e. Program Sub-committee Report Marilyn Listvan
- i. The Program Sub-committee met on Tuesday from 10-11 am and was attended by 16 people;
 - ii. Marilyn announced that Donna Sullivan will become Program Vice Chair;
 - iii. The deadline for Seminar, Workshop and Forum submissions is February 9. ASHRAE is encouraging use of the submission template on the website. Its use will soon become mandatory. Note that learning objectives must be included for Seminars and Workshops;
 - iv. Technical papers can be submitted directly by individuals and get priority. Peer review means that submission now would result in presentation in Orlando;
 - v. The TC 2.3 seminar on IAQP co-sponsored by TC 2.4, was presented in Chicago and was successful, attracting 50-75 people;
 - vi. In Atlanta, the Monday afternoon 3-4 pm time slot (previously the Publications meeting) will be used to run the Workshop titled *In the year 2035, will filtration be alive?* This is co-sponsored by TC 2.3;
 - vii. Other submissions agreed for Atlanta were: a Seminar on impact of PM_{2.5} and gases (co-sponsored by TC 2.3 and Standard 62.2), and three Workshops as follows: *Do we need a separate Method of Testing for residential air filters?* (champion is Tom Justice); *How can air filtration devices be evaluated by their PM efficiency performance (PM₁, PM_{2.5}, PM₁₀)?* (champion is Don Thornburg); and *Performance of filter test standards (EN779, ASHRAE 52.2, and ISO 16890)* (champion is Paolo Tronville);
 - viii. A Seminar on saving energy with filters has been proposed for Orlando. Ideas for St. Louis and Las Vegas include: following up Zied Driss's successful Seminar on hospitals with a Symposium; and a session on the impact of nanoparticles on health and the environment;
 - ix. Brian Krafhefer expressed concern about potential Monday 3-4 pm conflicts. Marilyn replied that this will not happen if we ensure that all programs scheduled are sponsored by both TC 2.3 and 2.4;
 - x. Mike Corbat proposed and Mike Waring seconded the motion to approve the Program Subcommittee Report. The motion was carried by a vote of 17-0-1-0-18 (CNV).
- f. Publications Report Marilyn Listvan
- i. There was no meeting on Publications in Chicago;
 - ii. Vijay (aka R. Vijayakumar) has published an interactive book on particle dynamics through Apple. It only plays on an Apple i-Pad and costs \$15.99;
 - iii. Marilyn asked people to email her with a list of their publications. The intent is to put a list of useful references on the TC 2.4 website as part of educating and informing viewers;

- iv. Tom Justice reported contact with Steve Hammerling who has nine questions on particles that need answers. Tom will distribute these to volunteer responders. Answers will be reviewed before submission. The Q&A will be posted as FAQs on ASHRAE’s website;
- v. Mike Corbat proposed and Mike Waring seconded the motion to approve the Publications Subcommittee Report. The motion was carried by a vote of 17-0-1-0-18 (CNV).

- g. Web Master Report Al Veeck
 - i. Note that the website is hosted by the National Air Filtration Association not ASHRAE. Posting items on the site is easier through NAFA, and there is more upload space which enables the TC to post photos;
 - ii. ASHRAE has been asking the TC to move its website to the ASHRAE server, but have now agreed that the website can stay on the NAFA server;
 - iii. Al is retiring after the Summer Meeting. He expects that NAFA will be willing to continue hosting the site, and said he will recruit a contact in NAFA who will post our material;
 - iv. A motion to approve the Web Master Report was proposed by Bruce McDonald, seconded by Christine Sun, and carried by a vote of 17-0-1-0-18 (CNV).

- h. Handbook Sub-committee Report Eric Brodsky
 - i. The Handbook Sub-committee meeting took place Saturday 1-2:30 pm and was attended by about 20 people;
 - ii. The Meeting Minutes are shown in Attachment #5;
 - iii. Chapter 29, “Air Cleaners for Particulate Contaminants”, in the HVAC Systems and Equipment Handbook will be re-published in 2016. Submission of the revised version is due in April this year. Changes for the hardcopy Handbook have been completed, and two electronic references are ready for the electronic Handbook. Eric asked the TC to vote to approve sending the Chapter and the electronic references to ASHRAE;
 - iv. Eric Brodsky proposed and Gemma Kerr seconded the motion to approve the Handbook Sub-committee decision to forward Chapter 29 with minor editorial changes, and the electronic references, to ASHRAE. The motion was carried by a vote of 16-0-1-1-18 (CNV).

9. Reports from TC liaisons.

- a. There were no reports from Liaisons to other TCs.

10. Old Business

- a. No items of Old Business were raised.

11. New Business

- a. Matt Middlebrooks, Chair of the US TAG to ISO TC 142, reported that the US plans to host the 2016 TC 142 Plenary Meeting, and asked for suggestions about suitable times and places, and on whether the meeting should be combined with another event such as the AFS meeting. The US last hosted the Plenary in 2013, when it was held in the ASHRAE Headquarters in Atlanta, and not coupled with another event.
- b. Al Veeck announced that NAFA has given a Lifetime Achievement Award to Barney Burroughs. Barney received a round of applause. Jim Hanley was the first recipient of this award.
- c. Barney Burroughs reported that the resurrection of Guideline 29 on Building Security is being given the go-ahead, and there will soon be a call for members.
- d. EHC’s Position Paper on the impact of air cleaners on health is going through the final approval process. Although individual members of TC 2.3 and 2.4 were involved in developing it, the TCs were not formally consulted and some members are upset. It was proposed that we ask for cognizant TCs to be used and recognized as official reviewers of Position Papers produced by

ASHRAE Standing Committees. Arguments against this were the possibility of negative comments from manufacturers whose products have been overlooked, and slowing of the already slow publication process. After some more discussion, a motion was put forward by Gemma Kerr, and seconded by Keith Chesson, asking the TC 2.4 Chair to write to ASHRAE requesting that Position Papers relevant to any TC go through, at minimum, a non-binding review process that includes that TC. The TC members voted to approve the motion 12-4-1-1 (CNV).

- e. Tom Justice reminded Sub-committee Chairs to forward their meeting notes or Minutes to Gemma for inclusion in the TC Minutes.
 - f. Charlie Seyffer reported that there have been complaints about ASHRAE Standard 145.2, the MOT for gaseous contaminant filters, because the US Green Building Council has made its use mandatory when pursuing the LEED IAQP Pilot, and there are some filter types (mainly powered devices) not included in the test scope. SSPC 145 is preparing to rewrite its scope. Charlie is worried that Standard 52.2 might be open to the same criticism.
12. The motion to adjourn was proposed by Al Veeck, seconded by Tim Johnson and carried unanimously. The Meeting was adjourned at 5:10 pm.

ATTACHMENT #1

ASHRAE Code Of Ethics (Approved by ASHRAE Board of Directors January 30, 2013)

1.140.001.1 As members of ASHRAE or participants in ASHRAE committees, we pledge to act with honesty, fairness, courtesy, competence, integrity and respect for others in our conduct.

- A. Efforts of the Society, its members, and its bodies shall be directed at all times to enhancing the public health, safety and welfare.
- B. Members and organized bodies of the Society shall be good stewards of the world's resources including energy, natural, human and financial resources.
- C. Our products and services shall be offered only in areas where our competence and expertise can satisfy the public need.
- D. We shall act with care and competence in all activities, using and developing up-to-date knowledge and skills.
- E. We shall avoid real or perceived conflicts of interest whenever possible, and disclose them to affected parties when they do exist.
- F. The confidentiality of business affairs, proprietary information, intellectual property, procedures, and restricted Society discussions and materials shall be respected.
- G. Each member is expected and encouraged to be committed to the code of ethics of his or her own professional or trade association in their nation and area of work.
- H. Activities crossing national and cultural boundaries shall respect the ethical codes of the seat of the principal activity.

ATTACHMENT #2

TC 2.4 Planning Subcommittee – Chicago Meeting Minutes

Tuesday, January 27, 2015

8:00 – 10:00 am

Grant Park (Palmer House Hilton, 6th Floor)

ACTION ITEMS SHOWN IN RED
TC 2.4 Committee votes shown in Blue

- 1) Call to order, Welcome and Introductions
- 2) Review draft agenda
- 3) Scope for the Planning Subcommittee

Evaluate and propose methods for improving the operations of TC 2.4 and its subcommittees (herein referred to as committees). This would include recommendations to the committees on "How" and "Why" we are operating as committees, ways to improve participation in TC 2.4 activities, and future activities and direction of the committees. The focus of the planning committee is not intended to be "What" we have done in the committees.

4) Road Map Review & Committee Reports (as needed)

- a. The meeting was spent revising the draft of the TC 2.4 Road Map section by section. The revised draft will be issued to the full TC for review, comment and input shortly after Chicago in order to incorporate the changes discussed in this meeting. **Release TC 2.4 Road Map Draft to the Committee – Gemma Kerr**
- b. TC 2.4 Main committee Section
 - i. Establish official Liaisons between TC 2.4 and ASHRAE 62.2, 52.2 & GPC 35:
 1. ASHRAE 62.2 Brent Stephens is the official liaison, but since 62.2 moved the filtration subcommittee to Saturday morning it conflicted with SSPC 52.2. **Tom Justice will request 62.2 to hold this subcommittee meeting at a time that does not conflict with 52.2.**
 2. SSPC 52.2 – John Zhang volunteered to be the official liaison.
 3. GPC 35 – Brian Kratthefer volunteered to be the official liaison.
 - ii. Establish Vice Chair's for all TC 2.4 subcommittees missing a VC
 1. Program – Donna Sullivan volunteered to be the VC.
 2. Publications – Dara Feddersen volunteered to be the VC.
 3. Planning – The unofficial VC is the TC 2.4 Secretary since the planning subcommittee chair TC 2.4 VC.
 - iii. Establish a Liaison for ISO TC 142 and WG 3 and WG 12
 1. ISO TC 142 – It is recommended this goes to the Chair of the US TAG, Matt Middlebrooks.
 2. ISO TC 142/WG 3 – Tim Johnson, who is a WG 3 Expert, volunteered to be the official liaison. This position should be filled by a WG Expert.
 3. ISO TC 142/WG 12 – Dara Feddersen, who is a WG 12 Expert, volunteered to be the official liaison. This position should be filled by a WG Expert.

- iv. Do we need a Liaison with the global climate change group (TC 2.5)? **Gemma Kerr to investigate**
 - v. Al Veeck, our current Webmaster and Membership subcommittee chair is retiring. Do we need to fill these positions? **Tom Justice to confirm plans with Al.**
 - vi. It should be encouraged for our Subcommittees to hold web meetings/telecoms as needed between the schedules face to face meetings at the ASHRAE conferences.
- c. Planning Subcommittee
- i. Keep the Road Map current and updated at least annually.
 - ii. The latest draft to be sent to all of TC 2.4 for comment after the Chicago comments are included.
 - iii. Updates/Items we know are needed
 - 1. How do we relate to ISO 16890?
 - 2. Residential filter standard?
 - 3. Timeline of the items we want to accomplish
 - 4. Long term goals
 - 5. Research Plan
 - 6. Standards Plan
- d. Membership Subcommittee
- i. How do we better communicate to the under 30 people at ASHRAE (Twitter world).
 - ii. Make a “welcoming” announcement to get new people to attend and participate at all subcommittee meetings and as part of the subcommittee TC 2.4 report out.
 - iii. **In the meeting planner sent out before each ASHRAE meeting, include at least 1 hot item for each subcommittee happening at the upcoming meeting – Tom Justice.**
 - iv. How do we get filtration end users to attend ASHRAE committee meetings and participate???
 - v. We need to do a better job at nominating people for ASHRAE awards...
- e. Research Subcommittee
- i. TC 2.4 Research needs to lay out a Research Road Map.
 - ii. The VC could be responsible for the road map?
 - iii. **Gemma Kerr will discuss this section with Michael Warring**
- f. Standards Subcommittee
- i. TC 2.4 Standards needs to lay out a Standards Road Map.
 - ii. The VC could be responsible for the road map?
 - iii. **Mike Corbat will work with Gemma on this section**
- g. Handbook Subcommittee
- i. Nothing to report

5) Adjourn

Minutes respectfully submitted:
 Don Thornburg
 TC 2.4 Planning Subcommittee Chair
 January 27, 2015

ATTACHMENT #3

ASHRAE RESEARCH SUBCOMMITTEE MEETING MINUTES Chicago, IL TC2.4 – Particulate Air Contaminants/Removal Equipment

Sunday, January 25, 2015
3:00 – 5:00 PM
Location: Palmer, Honore (L)

1. Call to Order, *Meeting began at 3:04 p.m.*
2. Introductions, *Sixty people signed the sign-in sheet.*
3. Review of Agenda
4. Chair's Comments, *Michael Waring, Research Chair, was present and led the meeting.*
5. Work Statement activity between meetings
 - a. 1649-WS Impact of Higher Efficiency Filtration on IAQ in Residential Environments with Central HVAC – Champion: Tom Justice (*Resubmitted to RAC on 12/15/2014, being considered this meeting*)

Discussion: Thad Ptak suggested the word "IAQ" in the title be more specific, and the TC agreed to change the word to "Particulate Matter."
 - b. RTAR-1734, Reproducing the Typical Urban Atmospheric Aerosol in Laboratory for Air Filter Loading – Champions: Paolo Tronville and Geoff Crosby, Cosponsored by SSPC 52.2 (*Was Returned by RAC previously, authors have moved onto WS phase at advice of Harvey Sachs, our RAC liaison*)

Discussion: The comments on this WS were relatively minor and easy to address, and one example of them was to define a 'typical' outdoor particle size distribution, which can be culled from Azimi et al., 2014 in Atmospheric Environment.

Paolo Tronville suggested that the research chair gather comments from the TC on RTAR and WS drafts to synthesize and send to authors.

Geoff Crosby discussed getting potential co-funding for this work from the power industry and turbine manufacturers.
6. RTAR activity between meetings
 - a. RTAR 1735, Evaluating effectiveness and costs of room air cleaners and central HVAC filtration for controlling particulate matter in residences – Champion: Brent Stephens (*Was Returned by*

RAC previously, author and other TC members, including Harvey Sachs, discussed and decided to stop work on this RTAR topic)

Discussion: This RTAR was dropped.

- b. RTAR 1756, Evaluation of low-cost particle and CO2 sensors for indoor air quality monitoring in smart building systems – Champion: Brent Stephens, Cosponsored by TC 1.2 (*Submitted to RAC on 12/15/2014, being considered this meeting*)

Discussion: This RTAR was submitted this RAC cycle. It is co-sponsored by TC 1.2, and the group discussed possible co-sponsoring with USGBC or some other agency. Geoff Crosby has talked to someone at USGBC who is doing some pilot commercial building IAQ study.

6. Current Research Project

- a. RP-1691 Modeling the impact of residential HVAC filtration on indoor particles of outdoor origin. (*The PMS met directly before this meeting. Dan Zhao and Parham Azimi also worked on the project.*)
 - i. Report from the PMS

Discussion: Brent Stephens briefly summarized the research, and PMS members Bruce McDonald and Paolo Tronville PMS agreed that the project was well done and completed on time. The final report should be approved shortly. Brent will give a presentation of the overall work at the next Research Meeting in Atlanta.

URPs were briefly discussed. Tom Justice said that at Chair's meeting, the URP route was offered as a viable path. Barney Burroughs mentioned that historically URPs used to come in with a curse, and that RAC used to be really against them (but apparently not anymore). Michael Waring reminded the TC to float URP ideas to the entire TC 2.4 research subcommittee before submittal.

7. Cosponsored Projects (for reference only)

- a. RP-1603 Role of HVAC Systems in the Transmission of Agents in Buildings and Intermodal Transportation (TC2.4 co-sponsor with TC9.6 and EHC. TC 9.3 main committee)

Discussion: Paolo Tronville (RP-1603 PMS member) updated the group: This project never got out of the literature review phase, and the PMS voted to terminate the project recently, however TC 9.3 voted to continue. The ASHRAE Board of Directors is meeting on Wednesday to decide on the path forward.

- b. TC 2.1 – 1624-RP Effective Energy Efficient School Classroom Ventilation (*Bid won by DANISH TECHNOLOGICAL INST. - Aarhus, Denmark*)

Discussion: Michael Waring was not sure of the progress of this research.

8. Work time on any RTAR, WS and other proposals for remainder of the meeting time

- a. 1626-RTAR Energy Implications of Air Filtration in Commercial Buildings (*Dara Feddersen is current Champion, and other writers are Jeff Siegel, Brent Stephens, Zied Driss, Michael Sexsmith, John Horns. Dara has mentioned getting a new draft ready sometime in January or February. Progress?*)

Discussion: *Dara Feddersen said she will have a draft in the next few months.*

- b. Impact on performance (efficiency and pressure drop) of air filters in high humidity and free moisture conditions. (*At last meeting, Bob Burkhead said would write to submit by Chicago 2015 meeting. Interest/help from: Paul Bryant, Michael Sexsmith. Progress?*)

Discussion: *Bob Burkhead said he will have a draft in February to submit to RAC by the next deadline. The group discussed including both high humidity and condensing environments. Dave Matier and Paolo Tronville discussed helping.*

- c. Discussion of new RTAR ideas

i) Filtration of viruses for different MERV classified filters (*Last meeting, Al Vatine is Champion and said he is interested in real world, in-situ testing, and others liked the idea; Brent Stephens said he would help. RTAR authors talked about checking overlap with RP-1603, which the RTAR authors will check on.*)

Discussion: *Al Vatine has not made any progress since the last meeting, though he has been working internally on it for a while. He believes the expected funding level to be \$400 to 500k. Jeff Siegel said differentiating it from RP 1603 would be critical, due to its poor record. Barney Burroughs said that traditionally ASHRAE stays away from health effects, but it is timely and could be more so if more outbreaks occur. Parham Azimi suggested the RTAR could also be broader focused to include on HVAC controls of viruses as well as only filters (i.e., RH control, air makeup, UV, etc.). Al Vatine said he may be able to get co-funding, but Jeff Siegel mentioned data ownership might stymie that. The working initial scope is viral removal efficiency as a function of MERV and impacts of humidity and temperature. Al Vatine and Parham Azimi will work on this.*

ii) Particle removal by building envelopes (*Last meeting, this was well-liked, and Brent and Vijay offered to champion. A particle deposition study was also discussed being rolled into this idea. Should we define a scope this meeting?*)

Discussion: *Brent Stephens doesn't want to champion anymore, but it is left on the list to consider at a later time. Vijay agrees with that approach.*

iv) RTAR on Round Robin with current 52.2 (*Voted to cosponsor this 'in spirit' at the previous TC 2.4 meeting. Four addenda are being approved around this time, and there will be new Round Robin testing when these take effect. Status?*)

Discussion: *A draft was presented at the 52.2 meeting on Saturday, and the group commented on it. Michael Waring is going to run it by Harvey Sachs. Barney Burroughs gave advice that RAC isn't used to working with test standards requests, and that continuous maintenance projects need to be well justified.*

v) MERV levels used in health care – tradeoffs between high air exchange rates and higher efficiency filters. (*Phil Maybee and Zied Driss agreed to 'take a look at the RTAR' last time. No progress in Seattle. Progress?*)

Discussion: There was no progress this time, but Zied Driss wants to keep it on the list. He is meeting with SSPC 170, and there is some interest in this topic. Michael Waring suggested rolling it into Al Vatine's RTAR idea above. Parham Azimi said that he and Brent Stephens have done modeling similar to this scope.

vi) Embedded sensors in filters. (Last meeting, Tom Justice reported that Brian Krafthefer is interested in sensors and nanotechnology embedded in filters, and that he will have a write-up for the next meeting. Progress?)

Discussion: Brian Krafthefer wasn't at this meeting. Jensen Zhang has talked to him about this, and believes he is interested in demand based filtration system and perhaps not embedded. However, others think the scope might be embedded sensors, so the scope is not really clear. Tom Justice will talk to him.

vii) Brand new ideas?

- (a) Develop a test method to evaluate the longevity efficiency of electrostatically charged media as an alternative to IPA discharge method (Rahul Bharadwaj)

Discussion: IPA alters the chemistry of filter media, but there is not enough data on what IPA does to media physically and chemically. Al Vatine and John Zhang will help on a draft of this RTAR.

- (b) Characterizing residential mechanical ventilation filtration (Brent Stephens)

Discussion: Did not get to due to time constraints.

- (c) Developing a database of commercial and residential filtration stats -- efficiency, pressure drop @ X IWC, etc. (Brent Stephens)

Discussion: Did not get to due to time constraints.

- (d) Impact of filtration on secondary organic aerosol (Michael Waring)

Discussion: Did not get to due to time constraints.

10. Liaison Report

Harvey Sachs said that RAC is trying to become more user-friendly. Questions to judge the worth of research projects are: 1) is this important work for ASHRAE, and 2) is there anyone else in ASHRAE who can help on this? He also reminded us that the direct-to-WS route is open. RAC is back to doing 'conditional acceptance' now, which means that your research liaison can approve the changes.

11. Adjournment, *The meeting was adjourned at 4:55 p.m.*

ATTACHMENT #4

MEETING MINUTES TC 2.4 STANDARDS SUBCOMMITTEE

Monday, 26 January, 2015
Honore (Lobby)
Chicago, IL
4:15 p.m. – 6:00 p.m.

Introductions

Chair's comments

Review proposed agenda

1) Update on standards and MTGs within scope of TC 2.4:

a) **SSPC 52.2 M.o.T. Air Cleaners for Particle Size Efficiency** – Bob Burkhead. Michael Corbat

- Four addenda to the publication are going forward. All four will be published at once.
- Three new addenda were submitted to be reviewed in Atlanta in June. Possibly for publication in the fall:
 - Proposed addendum to include E values when applicable to the MERV calculation alongside MERV. Also proposed to include 2.57 channel efficiency. Example MERV 14, E1-81%, E2 -92%, 2.57 – 90%.
 - Restrictions on use of the term “MERV.” Can't call it “MERV” unless a full 52.2 test is run – no “estimated MERV” or “initial MERV.”
 - Efficiency data set will be listed in the report summary.
 - Motion to make Appendix J a mandatory part of the standard failed. No new proposals followed.

b) **GPC 35** – Geoff Crosby

- Working on the Guideline – energy consumption caused by air cleaning devices
- Two main activities in progress:
 - Composition of procedure itself
 - RTAR 1734 – new loading dust which is representative of urban aerosol
 - Was submitted to RAC last May, rejected at June meeting
 - Preparing to re-submit in April timeframe, for review by RAC in Atlanta (June)

2) ASHRAE Liaisons:

a) **TC 2.3 – Gaseous Filtration** – Kathleen Owen

- i) **SSPC 145.1 Test Methods for Assessing Performance of Gas Phase Air Clean. Equip (Media)**
 - New draft has been approved, and should be up for sale within the next 1-2 weeks.
- ii) **SSPC 145. 2, Test Methods for Assessing Performance of Gas Phase Air Clean. Equip (Filter)**
 - Request was made to extend to cover reactive filters (powered, plugged in).
 - SSPC 145.1 and SSPC 145.2 will be covered under the same SSPC (142) going forward.

b) **TC 2.9 – UV Air & Surface Treatment** – Matt Middlebrooks

- Authorized a new GPC (GPC 37), to look into upper room systems – units that are rolled into a room to be used to decontaminate.

i) **SPC 185.1P Elimination of Microbial Contaminants in Air**

- Still in-process – 2nd public review is close. Nearing publication.

ii) **SPC 185.2 Elimination of Microbial Contaminants on surface**

- This has been published.
- c) **TC 5.4 – Industrial Air Cleaning – Bruce McDonald**
- i) **SPC 199 – MOT for Rating the Performance of Industrial Pulse Cleaned Dust Collectors**
- This committee has been working very diligently for the last 6 months, with Chris Fischer leading the effort. Web meetings have been taking place every 2 weeks to get this completed
 - As of this meeting, it is ready to be submitted to ASHRAE.
- d) **TC 9.6 – Health Care Facilities – Zied Driss**
- Nothing major to report. RP1603 may have implications to TC2.4. TC9.6 will no longer support this RP, due to lack of progress/results.
- e) **SSPC 62.1 – Commercial Ventilation – Charlie Seyffer**
- No report.
- f) **SSPC 62.2 – Residential Ventilation – Brent Stephens**
- Tom Justice provided the update.
 - Final report came out from ASHRAE on residential construction (following June '14 meeting)
 - 62.2 has a filtration task group, subcommittee – comprised of equipment people. Often referencing AHRI 680.
 - Bruce McDonald shared a PM2.5 presentation with this committee, and three webinars have been held.
 - They've come out with a filtration appendix document, discussion of attaching to 62.2
 - There was a “straw vote,” where the suggestion to recommend MERV 11 for residential applications was strongly supported.
 - Motion to make MERV 11 mandatory did not carry in a subcommittee vote.
- g) **SSPC 90.1 Energy Eff. Design of New Bldg – Christine Sun**
- No report.
- h) **SSPC 90.2 Energy Eff. Design of New Low Rise Res. Bldg –**
- No report – remove from agenda.
- i) **SSPC 161 – Air Quality in Commercial Aircraft – D. Matier**
- No report.
- j) **SSPC 170 – Ventilation of Healthcare Facilities – Zied Driss**
- SSPC 170 meeting was going on concurrently with this meeting.
 - Don Thornburg passed along some comments from Zied Driss (to be added later)
 - Removal of pre-filters...
 - Facilities Guideline Institute...
- k) **SPC 180 – Inspection & Maintenance of HVAC Systems – Phil Maybe**
- Rewrite, submit next version of 180 – will be coming out soon.
- l) **SPC 189.1 ASHRAE/USGBC/IESNA Standard for the Design of High-Performance Green Buildings except Low-Rise Residential Buildings (?inclusion of IAQ) – Charlie Seyffer**
- 189.1 will be merged with the International Code Council for one standard.
 - Meeting on Wednesday morning.
- m) **SPC 189.2 Design, Construction and Operation of High-Performance Green Healthcare Facilities (?inclusion of IAQ) –**
- No report.
- n) **US TAG for ISO TC142 – Don Thornburg Matt Middlebrooks**
- New chair – Matt Middlebrooks.
 - To maintain smooth operation, TAG will need advisory panel chairs for each WG
 - Geoff Crosby will assume advisory panel chairmanship for WG3

- Additional comments on WG3 below.
 - Looking for location suggestions for US host site of Fall 2016 plenary meeting. Joint US/Canada was proposed at first, but now is limited to US only due to political constraints.
 - Fall 2016 AFS conference was suggested as a possibility.
 - The last time the US hosted (Atlanta), ASHRAE helped out with meeting rooms, company sponsorships helped for dinners, etc.
 - Expect 60-80 people in attendance – need two rooms for three days, and one big room for plenary meeting. Send suggestions to Matt Middlebrooks.
 - o) **GPC 23 Guideline for the Design/Application of HVAC Equip. for Rail Passenger Vehicles** – Tom Justice
 - Nothing to report. Tom receives the minutes.
 - p) **Environmental Health Committee** – Barney Burroughs
 - No report.
- 3) **Old Business**
- a) **Report of Working Group Regarding: Proposal for new standard regarding residential filter test method** – Tom Justice, Chair
- 62.2 is reacting to ASHRAE President’s focus on residential. We want to capture this initiative.
 - Working on a Workshop for Atlanta through TC2.4 Program subcommittee.
 - Meeting with Stephanie to determine how to proceed – probably through 52.2.
- 4) **New Business**
- Al Veeck commented that an ASHRAE document on air cleaning and health went forward for approval – an effort that’s been in work for 2 years. ASHRAE has taken a position on the subject, and it’s a start to convey the message “clean air is good for your health.”

ATTACHMENT #5

ASHRAE MEETING MINUTES – Chicago TC 2.4 - Particulate Contaminants/Removal Equipment

Handbook Subcommittee Meeting

Sat. Jan. 24, 2015 1:00 – 2:30

1. Call to order 1:00 PM Eric Brodsky, Chair
2. Introductions
3. Attendees: Pat Marks, Michael Sexsmith, Gemma Kerr, John Simenson, Phil Maybee, Bob Burkhead, Tim Johnson, Tom Justice, Eric Brodsky, Dara Fedderson, Matt Ball, Keith Chesson, Don Thornburg, John Sabelli, Kyung-Ju Choi, Al Vatine, Stephen Nicholas, Dan Haas, Christine Sun

4. Session Notes

Chapter 29 was published in 2012 and updates for 2016 need to be completed and submitted to ASHRAE by April 18, 2015.

We conducted a working session and reviewed Chapter 29. About 3 areas were updated. The committee agreed to include as appropriate two supplemental references for the online electronic version, but not in the paper copy. The references are the Bruce McDonald presentation on comparing 52.2 and PM values; and Big-in/bag-out information from NAFA. E. Brodsky will coordinate with ASHRAE publications and the respective authors for inclusion of these documents. Updating of the Chapter format will be handled by ASHRAE.

The committee agreed to send the chapter as updated, with the ASHRAE appropriate inclusion of the two electronic references, and allowing for non- substantive grammatical changes to the full TC 2.4 for a vote to submit the chapter to Handbook for publication.

5. Next Steps

Pending a vote to approve, E. Brodsky will make the noted changes, and submit to the Handbook Liaison.

6. Other Business- none

Meeting adjourned -2:30

Prepared by Eric Brodsky,

Draft Minutes submitted: 1/27/2015

justfilter@yahoo.com, gkashrae@magma.ca , patrick.c.marks@jci.com