

**ASHRAE Technical Committee 5.12: Ventilation Requirements & Infiltration**  
**2004 ANNUAL MEETING Minutes**  
Monday, June 28, 2004, 4:15-6:30 pm  
Gaylord Opryland Hotel, Lincoln E, Nashville, TN

**Subcommittee Meetings:**

Handbook: Sunday, June 27, 6:30-7:30 pm, Opryland Hotel, Belle Meade (A)  
Program: Sunday, June 27, 5:30-6:30 pm, Opryland Hotel, Belle Meade (A)  
Research: Monday, June 28, 2:15-4:15 pm, Opryland Hotel, Lincoln E  
PMS for 1167-RP, June 27, 4:30-5:30 pm, Opryland Hotel, Belle Meade (A)  
PMS for 1169-RP, Monday, June 28, 1:00-2:15 pm, Opryland Hotel, Lincoln E

**Scope:** *TC 5.12 is concerned with ventilation, infiltration, airflow around buildings, and the reentry of exhausts, including their interactions with indoor air quality, HVAC system performance, and energy consumption.*

**1. Welcome & Introductions**

- Voting members sit at the table; all sign the attendance list and include contact data
- TC web site: <http://hvac.arce.ukans.edu/ashrae/tc4.03/main.htm> (migration needed)
- Distribution of agenda & minutes package

**2. Attendance & Quorum Check**

Voting members (present) for this meeting: **Boome**, **Carter**, **Emmerich**, **Lstiburek**, **Medina**, **Modera**, **Reardon**, **Walker**, **Zhang**, **Liddament (IM)**, **Olesen (IM)** (**Voting Members rolling off after this meeting are indicated in boldface**)

(quorum > 1/2 all VM, excl. IM; super maj. >= 2/3 VM present; simple maj. > 1/2 VM present)

- 3. John Wimer guest from National Center for Energy Management and Building Technologies (NCEMBT) from trades and SMACNA** – has literature to distribute. They have projects underway, and have funding in place and are interested in forging partnerships for future collaboration and co-funding. Contact coordinates: e-mail [jwimer@ncembt.org](mailto:jwimer@ncembt.org), phone (703) 299-5633, fax (703) 683-7615
- 4. Approval of Anaheim Meeting Minutes** (distributed at this meeting). Brief pause while members and guests reviewed draft minutes for corrections needed. *Ron Petersen is not reviser of AHRN-70 Airflow Around Buildings. Bernardo Cardenal did attend Anaheim meeting, but arrived late.*  
**Motion to approve the minutes as corrected passed (Carter/Emmerich: 6-0-0-CNV)**

**5. Announcements & Liaisons**

- Society liaisons (TAC *Int-Hout* present – reminded the chair that the rollover roster update is due. Informal survey about how people feel about recording of seminar presentations being saved as “streaming media” which is not easily pilfered. Presenters have the opportunity to decline to be recorded. The seminars DVD is being sold for this meeting, for future meetings this may become a membership benefit – born of requests from the regions. Invited discussion and feedback. One member mentioned that this information is available for sale but has no review and quality control and it may enjoy credibility that it may not merit. Another member supportive of providing more info to members who cannot attend meeting, concerned about durability and suggested simulcast rather than archive approach. Disclaimers likely to be dramatic. Another member indicated that the Board of Directors is trying to broaden dissemination – may need to provide means for remote accessers to provide comment and feedback. Streaming media can be easily captured so offers little real protection, adequate disclaimers should suffice. ASHRAE TC server will be changed in the very near future, so

webmasters are advised to back up their TC websites. *The Handbook CD Plus (which contains all four volumes, but unofficial version) content can be modified any time, so review changes and deletions from your chapters over the years and consider re-adding “babies that may have been thrown out with the bath water”. Hdbk chapters may be tested to ensure that the ASHRAE HQ bldg could be designed from the info currently contained in the Hdbk, within the next year or two. RAC Webb, Handbook Rock/Wells/Carscallen, etc.)*

- Standards Committee Liaison for 119, Frank Jakob – unaware of Public Review results – Rick Hermans and Claire Ramspeck. New rules at ASHRAE require disbanding SPC if not underway with slate of members within 12 months of initiation. Last fall BoD approved reaffirmation public review – no comments received – will be approved for reaffirmation as 119-(RA2004). The revision committee was initiated in 1999 in Minneapolis. No immediate action required by TC 5.12 at this meeting.
- Section 5 meeting announcements (*Reardon*). None that were not mentioned by TAC Section Head above.
- ALI: ASHRAE Learning Institute (*Boome*) Emmerich: Std 62.2 short course will take place tomorrow morning. Persily: ALI being combined to form Professional Development Committee – invitation open to submit new ideas (62.1 course) - chaired by Mark Heideman, Taylor Engineering.
- EHC: Environmental Health Committee (*Cardenal*) Present, attended EHC mtg. this afternoon – EHC want to hold a symposium in Denver on smoking in the hospitality industry – need a chair and papers. Elia Sterling already indicated interest in organizing and chairing a symposium on the same topic for Chicago. EHC has issued an IAQ position paper recently. EHC proposes a position paper for synthetic organic compounds. IAQ conference in 2007 in Orlando, looking for co-sponsors. Funds are available for research for indoor health effects. Want to adopt the WHO report “Rights to Healthy Indoor Air – May 2000”. Research on IAQ in commercial aircraft.
- ARTI: Air-Conditioning & Refrigeration Technology Institute (*Emmerich*): update on a couple of items: only one item listed in Anaheim minutes was approved – Evaluating residential systems to meet ASHRAE standard 62.2. Another project ongoing – Phase 2 of project on packaged roof-top units, springboard from phase 1 which had been completed, re-entrainment issues, field survey and CFD simulations – Emmerich serves on the PMS for ARTI on this project. ARTI reports are available for PDF download on their website. Steve issued invitation to participate on the subcommittee.

## 6. Subcommittee Reports

### a. Research (*Walker*):

- Report from Breakfast meeting. Incoming RAC Section 5 Liaison is Fred Kohloss. Updated RTAR and WS templates and cover sheets were distributed – all of which should be available for downloading from the ASHRAE website. A new checklist procedure for helping to assign a priority for a research project idea has been issued which gives the appearance of being quantitative and objective, and may become a required component of submitting an RTAR/WS.
- Active Research:
  - **“Heat Transfer During Residential Infiltration/Exfiltration”**  
**1169-RP** (PMS: *Reardon/Griffiths/Medina*) Additional no-cost extension to June 30, 2004 moved in Anaheim. PMS report: the revised final draft, submitted June 2004, probably needs some editorial corrections but has not been completely reviewed yet.

Technical paper status is unknown. PMS recommends that a further no-cost extension to March 1, 2005. Suggestion that a Letter Ballot be used to seek formal approval when PMS is satisfied with final report. **Motion to recommend to MORTS no-cost extension to March 1, 2005 passed (Walker/Carter: 5-0-1-CNV).**

- **“Indoor Environmental Effects on the Performance of School Work by Children”, 1257-RP** (PMS: *Sipes/Reardon/Federspiel*) PMS reported at the TC 2.1 Research Subcommittee on Sunday afternoon. On-schedule and on-budget.
- **“The Effect of Ganging on Pollutant Dispersion from Building Exhaust Stacks” 1167-RP** (PMS: *Chen/Kato/Wilson/Ratcliff*). Contract awarded to CPP finally in April 2004. Brief PMS verbal report from Yan Chen relayed by Jim Reardon. David Banks is leading the CFD part of the project, Ron Petersen is leading the wind tunnel part. DB met with the PMS Sunday afternoon, confusion due to lack of communication between PMS Chair and the Contractor. Ron Petersen reported at Res.Sub.Com. mtg. that single stack validation CFD/windtunnel results should be available for presentation/reporting at 2005 Winter meeting in Orlando. Chen dissatisfied with progress of the literature review task. RP expects this task will be ongoing throughout the project. Emmerich asked if CPP was aware of current ARTI-sponsored work on packaged roof-top units being done at Battelle.
- **“Multiple Space Effects on Ventilation System Efficiency in Standard 62” 1276-TRP** (PES: *Taylor/Wray/Reardon/Emmerich*) Contractor recommended in Anaheim. Delayed within RAC, partially due to a sole bidder on the second round of RFP. Action expected in Nashville – Reardon will attend the RAC meeting on Wednesday AM. Our outgoing RAC Section 5 Liaison Webb knows that Reardon will attend Wed. AM mtg. of RAC.
- Long-Range Research Plan (LRRP) for submission August 01, 2004:  
**Motion that the priority LRRP as listed below be approved, passed (Walker/Emmerich: 5-0-0-CNV)**
  - 1) **“Minimum Acceptable Dilution of Commercial Kitchen Exhaust”** with TC 5.10 (*Carter/Cardenal/Ratcliff/Wyon*) RTAR revision. WS status update. At Anaheim received comments, and Carter has sent revised RTAR and WS to ISW on this past Friday 25 June 2004. Reardon will help provide the contacts to share it with TC 5.10 people, for ISW, JJC and DPW. Discussion whether the now-proposed sample size to be presented to the trained odour panel is too large, sufficient, not large enough. Any other collaborators are invited to contact JJC.
  - 2) **“Dilution and Normalized Concentration Design Criteria for Laboratory Exhaust”** (*Petersen/Carter*)
  - 3) **“Influence of noise effects on usage of mechanical ventilation in residences”** – (depends on RTAR being prepared by Gren Yuill in time for Aug 1<sup>st</sup> deadline.)
  - 4) **“Simplified Procedure for Calculating Exhaust/Intake Separation Distances”** (*Wilson/Taylor/Carter/Petersen*) RTAR and WS status update. Carter expressed opinion that attempts to further simplify the procedure that exists in the handbook (AHRN-70), which is already inadequate, are not likely to be successful. Carter using perspective that chief concern is re-entrainment of exhaust of combustion by-products not ventilation exhaust or cooling tower exhaust flow. Carter was asked if the handbook procedure is sufficient – he feels it is, but the current procedure has errors that will be corrected in the AHRN-70 revision underway currently led by David

Wilson. It was suggested that the RTAR/WS title might be usefully changed from “procedure” to “guideline”. Ron Petersen says that we can do the calculation, but the criteria that must/should be met do not exist. Carter and Petersen requested that their names be removed from this research topic. It seems that there is not a research topic here. ISW will discuss this with Steve Taylor before putting the research topic suggestion to rest, and dropping it from the LRRP submission. JJC and DJW will be including this in the handbook chapter revision.

- 5) **“Occupant and Building Factors for Determining Ventilation Rates in Offices”** (*Taylor/Fisk*) This research topic was dropped from our research plan, after having been discussed for many years.
  - 6) **“Characterization of Infiltration and Ventilation in Mid- and High-Rise Multifamily Buildings”** (*Emmerich/Reardon/Hill*) No progress since Anaheim meeting. Craig Wray suggests that a call for comments be placed in either ASHRAE Insights or ASHRAE’s E-news to reach a much wider audience than a Forum. CPW provided a copy of his CMHC 10-building report to Steve Emmerich for his analysis and synthesis into this issue. Jim Reardon could provide a copy of his CMHC detailed one-building report to Emmerich for the same purpose, or collaborate with Steve in generating ideas.
- Other research ideas :
    - 7) Standard 62.2 encountered a challenge to the influence of noise on the use of residential ventilation fans. Std 62.2 sets limits on the maximum SONE rating allowed. There may be a research topic here. GKY feels that there is research to be done. David P. Wyon or TC5.3 have done research on this idea in office buildings. CPW and GKY recall 78 houses were surveyed related to this issue. ISW expressed concern that this discussion illustrates that the inter-subject variability may dwarf the other factors – but this may be a valuable conclusion for ASHRAE. Emmerich suggested that SSPC 62.2 could initiate research projects themselves, but would likely prefer to co-sponsor with TC5.12. GKY will work with Lily Wang, Univ.Nebraska, David Wyon and possibly a TC5.3 rep to try to develop an RTAR, for a Letter Ballot in time for Aug 1, 2004 submission as a new TC 5.12 RTAR.
    - 8) Chimney Backdrafting is a contentious issue still for 62.2. Research may be needed.
    - 9) Infiltration and air leakage from attached garages – CMHC/Health Canada has undertaken work recently – included in NIST literature review. NIST has also looked into the issue from measurement and simulation, and Emmerich may pursue this issue at NIST on the simulation level. CPW insisted that field trials will also be essential. Emmerich was asked to prepare an RTAR on this topic.
    - 10) ISW asked that Steve Emmerich, as Technical Subcommittee Chair of SSPC 62.2, regularly provide gaps and info needs to TC 5.12 Research Subcommittee meetings.
    - 11) CPW urged that the TC 5.12 Chair assign Corresponding Members to tasks and subcommittees to get them engaged in our research planning.
    - 12) Mort Blatt asked if anyone uses Std 119, 129 and 136 in designing buildings. Std 62.1 requires that ventilation effectiveness or ventilation efficiency be taken into account in designing the ventilation system. CPW indicated that 1276-TRP attempts to address part of this issue. ISW asked if a research project should be generated to improve Std 129 to be able to address situations of natural ventilation and infiltration. Steve Emmerich asked if the Std 129 method can be applied to displacement ventilation.

TC 5.3 and possibly TC 4.10 should be invited to participate in developing this topic. Recent water tank experiments by ISW have demonstrated that a 3-D approach must be used to adequately address room air distribution.

13) ISW solicited any further new research ideas (at both Res.Sub.Com. and main TC mtg).

14) TC 4.10 may rework completely their RTAR dealing with Natural Ventilation through Large Openings. ISW and Steve Emmerich have discussed recently with TC 4.10 (Duncan Phillips, etc.). Expected to lead to co-sponsoring.

ISW provided e-copy of RSC report/LRRP to JTR on diskette.

b. Program (Weston):

- Nashville, Seminar 5 “*Moving toward a rational approach to addressing mold problems in buildings*” Sunday 27 June 2004 8:00-10:00 AM Theresa Weston offered to analyze the comment feedback forms, collected by Reardon. Craig Wray will work with the Electronic Communications Subcommittee of TAC to examine if this can be automated and collected into a database.
- Proposed or planned program elements for  
Orlando – February 2005: **Motion to approve the Orlando Program plan, with priority in order listed, passed (Olesen/Modera: 6-0-0-CNV).**
  - (1) Seminar: (Emmerich) “What’s new in Standard 62.2?” Emmerich will ask SSPC 62.2 members for presentations.
  - (2) Forum: (Carter) will organize a forum on chapter 44 Applications.
  - (3) Seminar: (Cardenal) “Design & Constructing Buildings in Hot & Humid Climates” Suggested speakers include: Rodney Lewis and Chuck Dorgan, Joe Lstiburek, Danny Parker, somebody from Singapore (name to be provided Bjarne Olesen).
  - (4) Forum: (Blatt) “Should Standards 119, 129, and 136 be adopted into Code?” Joe Lstiburek may help co-moderate. Modera will approach Standards Committee to co-sponsor.
- Future Meetings  
**Denver – June 2005:**  
Symposium (Anil Parekh) on air leakage performance of non-residential buildings – possible speakers: Ashok at LBL, Brian Rock, and Steve Emmerich, issue call for papers.  
Seminar (Dave Butler) on 62.1 , (currently chaired by) – possible speakers: Dennis Stanke  
**Chicago – January 2006:**  
Symposium (Carter) on evaluation of CFD for internal and external airflows  
Symposium (Wray) “Designing for ETS in the Hospitality Industry” possible speakers: Brian Rock, Elia Sterling, Michael Apte, UC Berkeley scientist. (May slip in schedule, dependent on completion of the ETS Design Guide)  
**(Quebec City – June 2006)**  
**Other:**
  - Symposia: “Airflow Around Buildings” (Ratcliff or Schuyler), “Air Leakage Performance for Non-Residential Buildings”, “Infiltration Heat Recovery”, “Ventilation Requirements and Infiltration in Hot and Humid Climates” (Lstiburek or Griffiths)
  - Seminars: “Chapter 43 Applications”, “What Should be in the 62.2P Companion Guideline?”, “Evaluation of CFD for Modeling External and Internal Flows” (Carter), “Residential Ventilation Design” (Griffiths)
  - Forums: “62.1 Issues”, “62.2 Issues”, “What should be in 62.2 Users Guide?”

- Web posting of Seminars 7, 25 and 47 from Anaheim 2004 Winter Meeting update.
- TAW will e-mail the updated program spreadsheet table of program plans to JTR.

Meeting	Program	Title	Chair	Rank	Due Date	Comments
Jan 2004 Anaheim	Seminar	Exhaust and Intake Design Issues	Ron Petersen			~50 people
Jan 2004 Anaheim	Seminar	Residential Ventilation	Dianne Griffiths			65 review forms, well received
Jan 2004 Anaheim	Forum	What Should be in the 62.2P Companion Guideline?	Steve Emmerich			
Jan 2004 Anaheim	Forum	What is needed to make the Handbooks More Designer-Friendly?	Craig Wray			Co-sponsors: TAC and Handbook
Jan 2004 Anaheim	Poster Session	Exhaust contamination of Hidden vs. Visible Air Intakes 1168-RP				
June 2004 Nashville	Seminar	Moving toward a rational approach to addressing mold in buildings	Jim Reardon	1	2/13/2004	
June 2004 Nashville	Forum	What Should be in the 62.2P Companion Guideline?	Steve Emmerich	2	2/13/2004	
June 2004 Nashville	Forum	What should be in Chapter 44	John Carter	3	2/13/2004	
Jan 2005 Orlando	Seminar	Ventilation and infiltration in hot humid climate	Bernardo Cardenal		8/6/2004	
Jan 2005 Orlando	Seminar	Something and Avoiding Death in Residential Buildings	Ian Walker		8/6/2004	
June 2005 Denver	Symposium	Evaluation of CFD for modeling external and internal flows	Ron Petersen, John Carter		Draft: 9/04 final: 2/18/2005	
Jan 2006 Chicago	Symposium	Design for ETS. in Hospitality Facilities	Elia Sterling		Draft: 3/04 final: 8/05	
Jan 2006 Chicago	Symposium	Ventilation and infiltration in hot humid climate	Dianne Griffiths		Draft: 3/04 final: 8/05	
?	Symposium	Airflow Around Buildings	?			

c. Handbook (Carter):

- Society-wide Handbook series rewrite – update – nothing new – review and comment.
- Brian Rock has available copies of the official reviewers and revisers guide.
- 2005 Fundamentals Special Review - update
- Building Air Intake and Exhaust Design (AHRN-43), review/revision for the 2007 Applications volume is underway, led by David Wilson, assisted by John Carter.
- Airflow Around Buildings (AHRN-70), the revisions for the 2005 Fundamentals volume, led by John Carter, assisted by David Wilson are complete and have been submitted.

Letter Ballot to approve the completed revision was held, results of that vote are to be sent by e-mail to JTR by JJC, for inclusion in the minutes. **Motion by Letter Ballot to approve passed (Carter/Reardon: 11-0-0-CV).**

- Ventilation and Infiltration (AHRN-80), 2005 Fundamentals (*Walker*) Submitted. Letter Ballot held, results of vote to be sent by e-mail to JTR by JJC
- ALI “Building Air Intake and Exhaust Design” Course (*Petersen/Boome*)

d. Standards (*Emmerich*):

- TC 5.12 is the cognizant TC for:
  - **62-2001/SSPC 62.1**, Ventilation for/and Acceptable IAQ (in Commercial, Institutional, and High-Rise Residential Buildings) – A visitor, Jim Coggins, Vice Chair Educational Subcommittee of SSPC 62.1 reported that three documents are being worked on, republication of 62.1 is expected by end of 2004. The flood of addenda is expected to dry to a trickle. A Users Manual is expected to be published by mid-2005 and will be accompanied by a full-day 8-hour training course. Guideline 19P for journeyman design engineers is being planned – seeking help. Seeking collaboration with AIHA on their guideline, despite slightly divergent aims. Requested that TC 5.12 co-sponsor two back-to-back seminars in Orlando: overview of how 62.1 came about and how to use it tutorial and the building-component loads issues. **Motion to co-sponsor passed (Emmerich/Modera: 5-0-0-CV).** Collaboration to sponsor research projects on productivity linkages to maintenance.
  - **62.2-2003/SSPC 62.2**, Ventilation and Acceptable IAQ in Low-Rise Residential Buildings – the ANSI process of resolving the appeals is expected to be wrapped up by November 2004.
  - **119-1988 (RA04)**, Air Leakage Performance for Detached Single-Family Residential Buildings – recently released for Public Review for reaffirmation with editorial updates. The SPC Chair Joe Lstiburek wants to step down, TC will need to recruit a new chair if we want to review the standard. Emmerich is still willing to serve on a new SPC, but not as Chair. It was suggested that Std 90.2 would have to reference Std 119 before it would be worthwhile to consider revising Std 119. The basis typical airtightness data will have changed since Std 119 was first published.
  - **136-1993 (RA01)**, A Method of Determining Air Change Rates in Detached Dwellings – this will require action by this TC before 119 comes up. Action is supposed to be taken every five years. It was suggested that SSPC 62.2 be asked to consider adopting the substance of Std 136 into Std 62.2. Emmerich will communicate this suggestion.
  - **SPC 161P** (CoC, TC 9.3 is Lead), Air Quality Within Commercial Aircraft – Vote by the SPC recommended it to go out for Public Review, now goes to Standards Committee to go out for PR. Congratulations expressed for Byron Jones accomplishment as SPC Chair.
- Others of interest:
  - **129-1997** (TC 5.3), Measuring Air Change Effectiveness – no activity to report.
  - **152-2004** (TC 6.3), MOT ... Residential Thermal Distribution Systems – has recently been published.
  - SSPC **90.1** has received request to consider incorporating a continuous air barrier into that standard.
- **ETS Design Guide** – update (Persily PMS Chair/Rock PI): This is **NOT** a standard. PMS met Monday AM, and had a productive session, and progress is being achieved. Rock’s efforts to build consensus are bearing fruit, 3<sup>rd</sup> draft version exists. TC 5.12 is the

cognizant TC and will ultimately have the responsibility for voting to approve this design guide. It will be shared with other TCs for comment and feedback, when ready.

e. Honors (Cardenal):

- All encouraged to review their official Biographical Records on file at the Society and apply for Membership upgrades (associate member to member, fellow, life, etc.), as appropriate.
- Distinguished Service Award (15 pts.), Exceptional Service Award (45 pts.) Deadlines for submissions is May 1<sup>st</sup> for service awards, and December 1<sup>st</sup> for Fellow nominations of each year.

TC members recently recognized: Steve Taylor, Brian Rock and Craig Wray received DSA at this meeting in Nashville.

**7. Old Business**

- Technical Bulletins/FAQs (Reardon) CPW indicated we should refer to the TAC MOP, Appendix F, for guidance. Reardon will follow-up on status of the FAQs assigned to TC 4.3 and for which Art McIvor (deceased) had undertaken to prepare draft responses.

**8. New Business**

- 2004-2005 Roster Changes: rollovers, new members, subcommittee assignments.
- TC 9.5 introduction/invitation letter and initial roster has been received from its new Chair.
- Homeland security letter invitation to contribute ideas has been received from Van Baxter, Chair, Standards Committee & Mark Hegberg, TAC Chair
- Request for feedback (by July 1, 2004) regarding ASHRAE Standards used in Codes has been received from Martha VanGeem, Chair of the Code Interaction Subcommittee of the ASHRAE Standards Committee.
- Construction Specification Institute's ([www.csinet.org](http://www.csinet.org)) overhaul of the Master Format Specification numbering system – publication scheduled for mid-2004 TEGA/TC7.1 – Charles Gullledge, Vice-Chair TC 7.1, is currently serving as the CSI/ASHRAE Liaison.
- TC 5.12 website is currently hosted on a server located at U. of Kansas, which may be shut down. Need volunteer to help migrate website to ASHRAE server, and to be able to back it up frequently (TAC Section 5 Head reported at beginning of the meeting that ASHRAE server is being changed and enhanced for this purpose very soon). Steve Emmerich will check with his supervisors if he can host the website and serve as TC Webmaster.

**9. Adjourned at 7:04 PM**

- Next meeting: February 7, 2005, ASHRAE Winter Meeting, in Orlando, Florida

Attendance listing table – checked off by chair, Jim Reardon (May be this is the attendance list from Anaheim 2004 Winter Meeting – need to check and correct.)

First	Last	Affiliation	Email
Voting Members			
John	Carter	CPP	<a href="mailto:jcarter@CPPWIND.com">jcarter@CPPWIND.com</a>
Steve	Emmerich	NIST	<a href="mailto:steven.emmerich@nist.gov">steven.emmerich@nist.gov</a>
Joseph	Lstiburek	Building Science Corp	<a href="mailto:joe@building-science.com">joe@building-science.com</a>
Mario	Medina	University of Kansas	<a href="mailto:mmedina@ku.edu">mmedina@ku.edu</a>
Jim	Reardon	National Research Council Canada	<a href="mailto:James.Reardon@nrc.gc.ca">James.Reardon@nrc.gc.ca</a>
Iain	Walker	LBNL	<a href="mailto:iswalker@lbl.gov">iswalker@lbl.gov</a>
Jensen	Zhang	Syracuse University	<a href="mailto:JSZhang@syr.edu">JSZhang@syr.edu</a>
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Paul	Pinkston	Tek-Air	<a href="mailto:p.pinkston@tek-air.com">p.pinkston@tek-air.com</a>
Brian	Rock	University of Kansas	<a href="mailto:hvacman@ku.edu">hvacman@ku.edu</a>
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Steve	Taylor	Taylor Engineering	<a href="mailto:staylor@taylor-engineering.com">staylor@taylor-engineering.com</a>
Theresa	Weston	DuPont	<a href="mailto:theresa.a.weston@usa.dupont.com">theresa.a.weston@usa.dupont.com</a>
Craig	Wray	LBNL	<a href="mailto:CPWray@lbl.gov">CPWray@lbl.gov</a>
Others			
George	Carscallen	ASHRAE Hdbk Liaison 2005 Fund	<a href="mailto:gfcars@gwal.com">gfcars@gwal.com</a>
Jan	Kosny	ORNL	<a href="mailto:kjo@ornl.gov">kjo@ornl.gov</a>
Louis	Lazure	IRSST	<a href="mailto:lazure.louis@irsst.qc.ca">lazure.louis@irsst.qc.ca</a>
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Cory	Weiss	Effikal Int'l	<a href="mailto:coryw@effikal.com">coryw@effikal.com</a>