

**AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND  
 AIR CONDITIONING ENGINEERS, INC.**

1791 Tullie Circle, NE / Atlanta, GA 30329  
 (404) 636-8400

**TC/TG/TRG MINUTES COVER SHEET**

(Minutes of all TC/TG/TRG Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/TRG NO.:	<b>4.10</b>	TC/TG/TRG TITLE:	<b>INDOOR ENVIRONMENTAL MODELING</b>		
DATE OF MEETING:	Jun. 27, 2005	LOCATION:	Denver, CO		
DATE ISSUED:	Jun. 27, 2005	RECORDED BY:	Chao-Hsin Lin		
VOTING MEMBERS	TERM		PRESENT	SUB-COMMITTEE CHAIRS	
	On	Off			
Schwarz, Walter, Chair	03	05	✓	Membership	Hosni, Mohammad
Dols, William (Stuart), Vice Chair	00	05	X	Programs	Srebric, Jelena
Ensor, David	01	05	✓	Research	Phillips, Duncan
Bennett, James (Jamie)	04	08	✓	Standards	Ensor, David
Tronville, Paolo (Intl)	02	06	✓	Web Page	Dols, W. Stuart
Musser, Amy, Secretary	01	05	X	Secretary, Handbook	Musser, Amy
Zhai, Zhiqiang (John)	04	08	X		
Srebric, Jelena	02	06	✓		
Khalifa, Hussein E. (Ez)	02	06	✓		
Nielsen, Peter (Intl.)	04	08	X		
Kerr, Carolyn (Gemma)	02	06	✓		
Van Gilder, James	01	05	✓		
Yang, Xudong (Don)	01	05	X		
Lin, Chao-Hsin	03	07	✓		

Technical Committee 4.10 – Indoor Environmental Modeling  
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CORRESPONDING MEMBERS		PRESENT	CORRESPONDING MEMBERS		PRESENT
Anderson, Ren			Levin, Hal		
Arens, Edward			Manning, Andy		
Armstrong, Peter			Markel, Lawrence		
Axley, James			Melikov, Arsen		
Baker, AJ			Murakami, Shuzo		
Barakat, Sherif			Novaselac, Atila		
Barles, Pierre			O'Brien, Sean		
Beausoleil-Morrison, Ian			Offermann, Francis		
Becker, Bryan			Olesen, Bjarne		
Berkoe, Jonathan			Pei, Hsien-Sheng		
Blackmore, Byron			Phillips, Duncan		✓
Carter, John			Rahai, Hamid		
Chen, Qingyan			Rivers, Richard		
Christianson, Leslie			Roberts, Jack		
Clark, Daniel R.			Rogers, Lisa		
Colliver, Donald			Sanchez, Greg		✓
Emmerich, Steven			Sawachi, Takao		
Fanger, P. Ole			Seppanen, Olli		
Farrington, Franklin			Sestak, George		
Gadgil, Ashok			Shaw, Chia-Yu		
Gordon, Elliott			Sohn, Chang		
Grimsrud, David			Sinclair, Ray		
Grot, Richard			Teichman, Kevin		
Haghighat, Fariborz			Tompkins, Dean		
Hall, John			Vandermeullen, Paul		
Hensen, Jan			VonKempski, Diotima		
Hernandez, Mark			Walton, George		
Hirnikel, Dan			Willman, Alexander		
Horstman, Ray		✓	Yoshizawa, Susumu		
Hosni, Mohammad		✓	Zhang, Jianshun (Jensen)		✓
Int-Hout, Daniel			Zhang, Wei		
Jones, Gordon					
Jones, Robert					
Kato, Shinsuke					
Kelso, Richard					
Kirkpatrick, Allan					
Knappmiller, Kevin					
Krafthefer, Brian					

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<b>ADDITIONAL ATTENDANCE</b>			
Dave Banks	Xinlei Wang		
Chris Sideroff	Byron Jones		
Paul Lebbin	Julian Rimmer		
Gaurav Mehte	Lance DeLaura		
Kai Kang			
Joseph Firrantello			
Kwok Wai Tham			
Kelly Knight			
<b>Society Liaisons, etc.</b>		<b>PRESENT</b>	
Wray, Craig	TAC Section Head	✓	
Hydeman, Mark	Prof. Devt. Committee		
Brandemuehl, Michael	Research Liaison		
Reeves, George	Standards Liaison		
Hosni, Mo	Program Liaison	✓	
Bahnfleth, William	TAC Chairman		
Ferguson, Kimball	Special Publications Liaison		
Ramspeck, Claire	Staff Liaison (Standards)		
Gulledge, Charles E.	TEGA Liaison		
Vaughn, Michael	Staff Liaison (Research)		
Vaughn, Michael	Staff Liaison (Tech. Services)		
Conway, Mark	Handbook Liason 2005 Chap 34 Fund.		

**Call to Order:** Chairman Walter Schwarz called the meeting to order at 2:15 p.m.

**Welcome and Introductions:** Walter Schwarz.

**Roll Call:** 8 voting members were present (including one international member), 4 voting members were not present.

**Minutes:** from the last meeting held in Orlando were reviewed. Minutes were approved [**8-0-0-12** (For–Against–Abstain–Total Voting Members present)].

**Announcements:** Walter Schwarz

- Walt attended the chairs meeting and reported:
- Anyone who needs a letter from the ASHRAE president to his/her employer about the individual's ASHRAE activity should see Walt.
- Please see Ray Horstman to nominate someone for the George B. Hightower Tech. Achievement Award.
- Another ASHRAE award for people who has served/contributed to ASHRAE research. To nominate a candidate, please see Ray Horstman for that.
- Walt outlined ASHRAE's strategic goals.
- Section 4's website needs the summary of each TC's research, handbook and program activities supplied by the chair of each sub-committee.
- Section 4 is coming up with strategic goals. Our immediate goal is to develop a cohesive and comprehensive listing of information and procedures for section 4.
- Discussions on whether TC should avoid to have any programs on Wednesday morning.
- Mo Hosni would like to thank the authors and reviewers who made our two innovations and advances in room air distribution symposia for this conference a great success. We will plan a repeat performance for Winter 2007.
- Craig Wray – TAC section head stopped in to greet us.
- He congratulated the TC for its completion of the handbook chapter.
- He also presented a certificate of appreciation for Walt's service to this TC.

**Membership:** Jamie Bennett

- Voting members who will roll off after the Denver meeting in June are: Amy Musser, David Ensor, James VanGilder, Xudong Yang, and Walter Schwarz.
- New voting members who will come on after the June meeting are: Duncan Phillips, David Banks, and Greg Sanchez.
- Several of our officers and subcommittee chairs will change following the June meeting. The new listing is:
  - Chair: W. Stuart Dols
  - Vice Chair: Ez Khalifa
  - Secretary: Chao-Hsin Lin
  - Research: Jelena Srebric
  - Program: Jim VanGilder
  - Handbook: David Banks
  - Membership: Jamie Bennett
  - Standards: David Ensor
  - Webmaster: W. Stuart Dols
  - ALI: John Zhai
  - Honors and Awards: Ray Horstman
- Please contact Jamie or Walter if you are interested in becoming a corresponding member of the committee.

**Research:** Walt Schwarz (on behalf of Duncan Phillips)

- Information from the chairs' meeting:
- Good turnout for the Research sub-committee meeting.
- We have 2 WSs ready to be submitted (by Aug. 15<sup>th</sup>).
  1. WS 1321 (old #2004-20): *Modeling VOC Sorption of Building Materials and Its Impact on Indoor Air Quality – Phase II* (Second Phase of RP-1097, written by Jianshun Zhang). Resubmitted to address comments from RAC
  2. WS 1271: *Modeling Low Velocity Large Scale Fluctuating Flows in Ventilated Spaces at Transitional Reynolds Numbers* (written by Ray Horstman)
- We have 2 RTARs to be submitted (by Aug. 15<sup>th</sup>).
  1. RTAR 1418: *Optimizing the Trade off Between Grid Resolution and Simulation Accuracy: Coarse Grid CFD Modeling* (written by Jelena Srebric) [#1418-0510 2005-33]
  2. *Quantifying the Macro Effects of Occupant Movement on Indoor Air Mixing* (written by Walt Schwarz) [#1419-0510 New RTAR].
- Approve for submission **[8-0-0-12]**
- Jelena: We have 6 new proposed RTARs.

RTAR #1: *Modeling Radiation for Indoor Air Quality and Comfort*, (Greg Sanchez is to revise the draft).  
RTAR #2: *Reduced Order Modeling for Near Real Time Predictions of Contaminant Distribution (Multi-zone+CFD)*, (Ez Khalifa is to revise the draft).  
RTAR #3: *Modeling Contaminant Transport and Dispersion from the Human Body* (drafted by Xudong Yang).  
RTAR #4: *CFD Boundary Conditions for Under-floor Diffusers*, (Julian Rimmer, sent RP-1009 info and TC 5.3 TC 4.1 contacts).  
RTAR #5: *Natural Ventilation*, (David Banks, sent an old Yan's RTAR).  
RTAR #6: *Convective Surface Emissions Resulting from Local Turbulent Airflow*, (Ez Khalifa is to develop the draft).
- New drafts should clearly state its value to ASHRAE with respect to ASHRAE's strategic goals.
- It is good to have multi-TCs to co-sponsor a RTAR.
- Duncan: There is no limit of the number of RTAR to submit by Aug. 15<sup>th</sup>, Dec. 15<sup>th</sup> or May 15<sup>th</sup>. RTARs can stay for only 2 years and cannot be brought back for consideration again after that.

**Program:** Jelena Srebric

- Ray's animation for the seminar this morning was fantastic and should be adopted for the TC future programs.
- Chicago, IL – Winter 2006 (Deadline for papers Apr. 1, packages due Aug. 5)
- **Material Emissions/Adsorption and IAQ** symposium organized by Gemma Kerr. She is too busy and will like to delay it or have a substitute to chair it. Ez Khalifa is willing to organize this symposium but cannot be in the reviewing process. Mo Hosni will help to chair this meeting but would like to move it to Quebec City.
  - **Modeling and Measuring the Combined Air, Heat, Moisture and Pollutant Transfer through Building Walls** symposium organized by Stuart Dols (move to Quebec City)
  - **Benchmark Cases for CFD modeling** – forum organized by Peter Nielsen (on schedule)
  - **“How to report CFD right?”** or **“To CFD or not to CFD?”** proposed by Walt Schwarz
- **“Low-order Modeling of Room Air Flows”** seminar organized by Ez Khalifa (moved from Quebec City)
  - After brainstorming, the priority list for the Chicago program will be (1)Nielsen (2)Ez Khalifa (3) Walt Schwarz was approved by **[8-0-0-12]**.
- Quebec City – Summer 2006 (Deadline for papers Sept. 23 2005, packages due Feb. 10 2006)
- **Flow in the personal microenvironment** seminar or symposium organized by Ez Khalifa
- **Coupling CFD and Multizone modeling** – seminar or symposium organized by Xudong Yang
- New Program: Dallas – 2007
  1. *Natural Convection*, Duncan Phillips (to go ahead or not will be announced in Chicago).
  2. *Modeling Personal Micro-Environment*, Jensen Zhang.
  3. *Modeling Thermal Radiation in Indoor Environment*, Jim Van Gilder.
  4. *Modeling Museum & Performing Art Centers*, Walt Schwarz.
  5. *Integration of Noise Calculation into CFD Modeling*, Greg Sanchez.
  6. *Hospital Modeling*, Julian Rimmer.

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**Handbook:** Dave Banks (on behalf of Amy Musser)

- Our 2005 Fundamentals Chapter is out. Please give feedback on this version to Dave.

**Standards:** Dave Ensor

- We do not have any standards in this TC.
- TC 2.4 has been discussing the set up of a standard for electrostatic charged filters.
- ISO is contemplating a standard related issue for nano-technology. No known implication with respect to TC 4.10 yet.

**Web Site:** Walt Schwarz (on behalf of Stuart Dols)

- Walt will forward Ray's animation to Stuart.
- Stuart mentioned there's no space allocated for Section 4 website.

**Relevant Activities:**

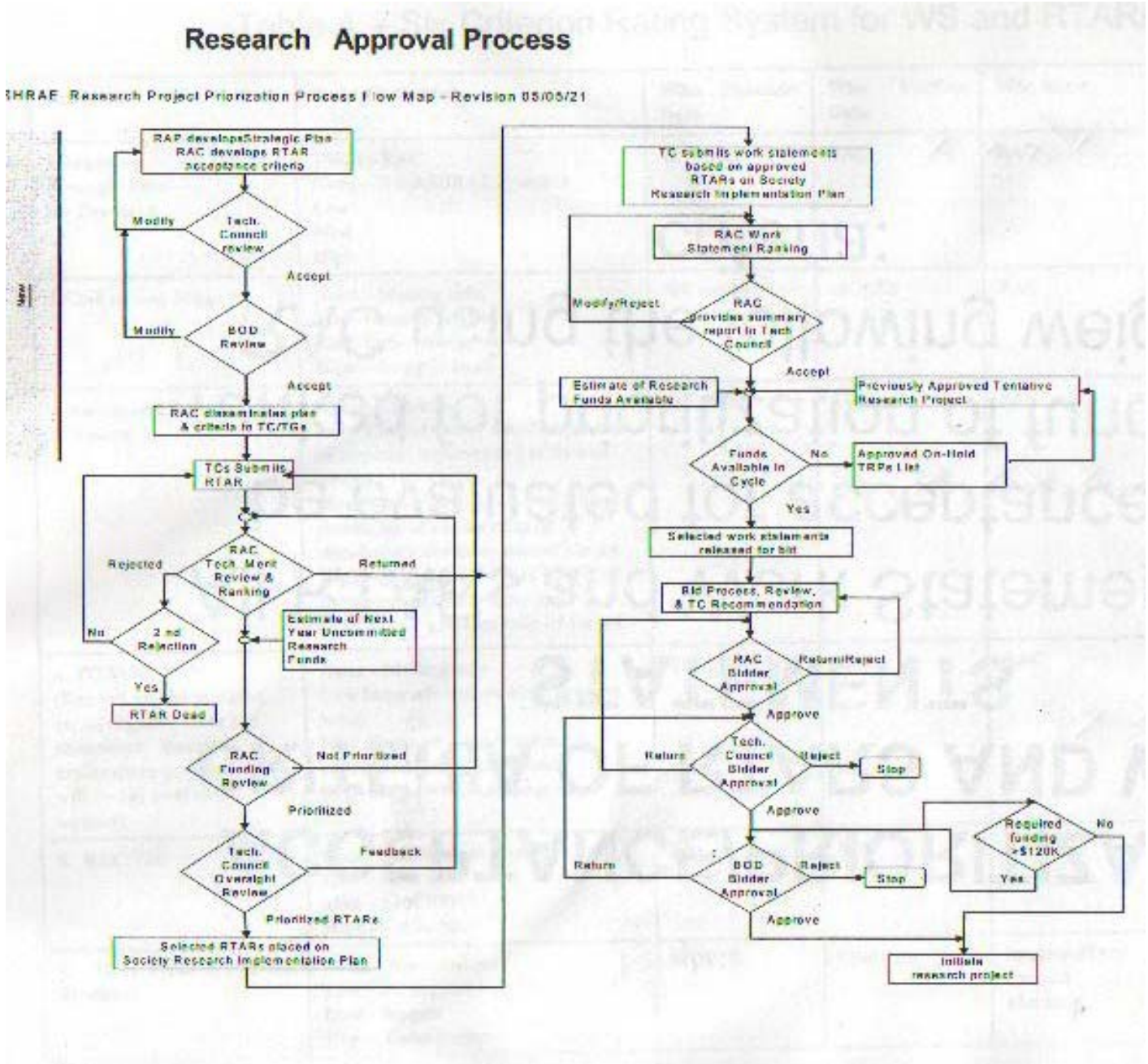
- TC1.2 Instruments and Measurements - Arsen Melikov (not present)
- TC2.1 Physiology and Human Environment - Diotima Von Kempfski (not present)
- TC2.3 Gaseous Air Contaminants/Removal Equipment - Gemma Kerr (left early)
- TC2.4 Particulate Air Contaminants/Removal Equipment - Dave Ensor
  - There is a new guideline project GPC26 to make a guideline for in situ particulate measurement (for filters and the system)
- TC5.3 Room Air Distribution – none
- TC5.6 Fire and Smoke Control - David Banks
  - This committee has a symposium of CFD on smoke and fire in this meeting.
- TC5.8 Industrial Ventilation - Duncan Phillips
  - This committee has interests in displacement ventilation.
- TC 5.12 Ventilation and Infiltration – David Banks
  - This committee has an upcoming seminar or symposium on validation of CFD modeling in Quebec City.
- TC9.3 *Transportation* – Ray Horstman
  - SPC 161 is redefining ventilation effectiveness.
- TC9.6 *Health Care Facilities* – Duncan Phillips
  - This is a new TC. They are interested in measuring energy usage in this type of facilities.

**New Business:**

- There are errors on our email list. We need to fix that.
- More discussions regarding sessions on Wednesday morning. ASHRE is considering incentives to encourage people stay on Wednesday morning such as rebates of part of your fees, etc.

A move to adjourn was made and approved at 4:10 pm. (8/0/0/12)

**APPENDIX A: RESEARCH APPROVAL PROCESS**



**APPENDIX B: DESCRIPTION OF TC'S SCOPE (FROM WEBSITE)**

TC 4.10 is concerned with developing, evaluating and recommending procedures for predicting indoor environmental conditions including thermal, acoustical, illumination, and air quality for new or existing buildings.