

**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.: **TC 1.12**

TC/TG/TRG TITLE: **Moisture Management in Buildings**

DATE OF MEETING: **1pm to 3pm, June 25, 2011** LOCATION: **Hilton Bonaventure Montreal, Point-Aux-Trembles (Lower Level), Montreal QC**

Minutes approved at the Chicago Winter Meeting, January 21st, 2012

| MEMBERS PRESENT | TERM EXPIRES 6-30 | MEMBERS ABSENT | TERM EXPIRES 6-30 | EX-OFFICIO MEMBERS |
|-------------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------|
| Raymond Patenaude | 2011 | Holly Bailey | 2011 | |
| Lew Harriman III | 2012 | Larry Elkin | 2013 | |
| Steve Cornick | 2013 | Andreas Holm | 2012 | |
| Hugo Hens | 2013 | Achilles Karagiozis | 2013 | |
| Louis Kelter | 2012 | | | |
| Paul Shipp | 2013 | | | |
| Anton TenWolde | 2012 | | | |
| Jeff Traylor | 2012 | | | |
| Raoul Webb | 2014 | | | |
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| CORRESPONDING MEMBERS PRESENT | | CORRESPONDING MEMBERS ABSENT | | ADDITIONAL ATTENDANCE |
| Andre Desjarlais | | Fiona Aldous | | Moonis Ally |
| Hartwig Kuenzel | | Mark Anderson | | Stan Gatland |
| Wahid Maref | | Gil Avery | | Gordon Hart |
| Alex McGowan | | Stephen Barefoot | | Fitsum Tariku |
| Theresa Weston | | Ron Bailey | | |
| | | Marcus Bianchi | | |
| | | Doug Bibee | | |
| | | Leonard Damiano | | |
| | | Claudio Darras | | |
| | | Diana Fisler | | |
| | | Manfred Gerber | | |
| | | Sam Glass | | |
| | | Michael Hayes | | |
| | | Dale Herron | | |
| | | Carl Lawson | | |
| | | Mark Lawton | | |
| | | Neil Leslie | | |
| | | Rodney Lewis | | |
| | | Him Ly | | |
| | | John Murphy | | |

| | | | | |
|--|--|-----------------|--|--|
| | | Albert Pucino | | |
| | | Mika Salonvaara | | |
| | | Ella Sterling | | |
| | | Dave Warfield | | |
| | | Bede Wellford | | |

DISTRIBUTION

All Members of TC/TG/TRG plus the following:

| | |
|---|-------------------------|
| TAC Section Head: | Victor Penar |
| TAC Chair: | Dr. Charles H Culp, III |
| All Committee Liaisons As Shown On TC/TG/TRG Rosters: | |
| Manager of Standards | Stephanie Reiniche |
| Manager of Research & Technical Services | Mike Vaughn |

TC 1.12 Moisture Management in Buildings

1 to 3pm, June 26th 2010

Hilton Bonaventure Montreal, Lower Level, Point-Aux-Trembles, Montreal QC

1. Call to order – Ray Patenaude, P.E. – Chair

Chair Ray Patenaude calls meeting to order at 13:00.

2. Self-Introduction of members and guests – Ray Patenaude

Those present introduced themselves, there were no liaisons present.

3. Approval of minutes from Las Vegas meeting – Steve Cornick

Motion: Jeff Traylor moved to accept the draft minutes from Las Vegas. Alex McGowan seconded pending minor edits. Motion carried (8, 0, 0, CNV).

4. Review agenda – Ray Patenaude

There were no changes to the agenda. Agenda attached

Motion: Steve Cornick moved to approve the agenda, seconded by Anton ten Wolde. Agenda approved (8, 0, 0 CNV).

5. Chairman’s report – Ray Patenaude

Report from the Chair: The TC (1.12) has expanded out from what we have accomplished in the past, moisture in buildings, to issues that surround topics such as the building envelope and the interaction of the building envelope with the rest of the building. The Committee now has an active and vital committee structure so that we can now move forward with an important agenda item – trying to get a multidisciplinary task group (MTG) to deal with common issues with respect to ASHRAE moisture issues and the building envelope using an integrated multidisciplinary approach.

6. ASHRAE Mold Position Document – Lew Harriman

The mold position document was released to the Committee (TC 1.12). The Environmental Health Committee (EHC) is the cognizant committee. The mold position committee works for Tech Council which will vote on the documents and if approved send it on to the Board of Directors. The current draft, the 9th draft, was submitted to TC 1.12, EHC, and TC 9.1 “Large Building Air-Conditioning

Systems” for comment. Twelve sets of comments were received, ranging from to light weight positive comments to comments that suggested we must redo the whole thing. Comments will be assembled and a new draft written, submitted to the mold committee, and resubmitted to Tech Council before the end of July.

7. Research – Lew Harriman (for Larry Elkin Research Chair)

a. Status update – Pool evaporation work statement (WS-1566, developed by TC 8.10)

The work statement was sent back from RAC with the comment that it was oversimplified and that it should be made more comprehensive and authoritative but less expensive!

b. Status update – DOAS design guide (1565-WS)

The work statement went out to bid but no bids were received. The work statement will go out for re-bid in the fall.

c. Research topic suggestions

The request for research ideas was extended to the Montreal meeting. Three research topics were submitted for discussion. There were no other suggestions or discussion. Steve Cornick and Stan Gatland will conduct a 1-hour long brainstorming session at Chicago winter meeting during the research subcommittee meeting. A building pressurization RTAR by TC 1.8, posted on the TC Google site, was approved by RAC. They are looking for co-sponsorship and PMS members.

Action item: Steve Cornick and Stan Gatland will prepare a 1-hour long brainstorming session for Chicago in January 2012.

8. Program – Alex McGowan, P. Eng.

a. Programs at the Montreal meeting

- i. Forum 1 “What should be in a moisture management chapter in the ASHRAE Handbook?” Chair: Alex McGowan*
- ii. Forum 10 “Should ASHRAE Create a Standard on Building Envelopes?” Chair: Ray Patenaude*
- iii. Seminar 26 “Prevention of Condensation in Mechanical Insulation Systems” Co-sponsor with TC1.8*

b. Proposed programs for Chicago “High Performance Buildings, Integrated Design, Energy Modeling and Specialized Applications (January 2012)

- i. A Seminar entitled “Mold, moisture management and human health” Chair: Steve Cornick*
- ii. A Seminar entitled “What does the HVAC engineer need to know about building enclosures?” Chair Ray Patenaude (proposed co-sponsor with TC4.2 , TC4.3 and TC4.4)*
- iii. A Seminar entitled “Impact of ASHRAE Standards on Moisture Management in Buildings” Chair: Gil Avery*
- iv. A Seminar entitled “Moisture management aspects of commissioning and integrated design”? Neil Leslie Chair*

c. Proposed programs for San Antonio (June 2012): Themes have been discontinued for San Antonio

- i. A Seminar entitled “International Case Histories on Moisture Management in Hot Climates” Chair Achilles Karagiozis*
- ii. A Conference Paper Session: “Field Measured Values of Worldwide Indoor Residential Humidity” Chair: Marcus Bianchi*

- iii. A Seminar entitled “Building envelopes: real-world case histories in moisture management” Chair: Lew Harriman
- iv. A full-day training program on “What does the mechanical engineer need to know about building enclosures?” provided by Hugo Hens
- v. A Conference Paper Session: “Solving Moisture Problems Created By Energy Efficient Design,” Chair: Alex McGowan (seeking TC 4.4 co-sponsorship, and seeking authors from TC1.12 and TC4.4)

d. Proposed programs for Dallas (January 2013) – there were program items proposed for Dallas.

Seminars or forums not approved for the Chicago meeting will be re-visited for the San Antonio meeting.

For more detailed see the Program Subcommittee report, attached.

Motion: Alex McGowan moved that TC 1.12 accept the program plan as outlined, seconded by Steve Cornick. Motion carried (8, 0, 0, CNV).

9. **Website – Steve Cornick.**

Websites/Google group/Google site:

Cornick reported that members are beginning to use the TC Google site as a work area and encouraged members to continue to do so. A short presentation was posted to the TC Google site to help members use both the site and the Google group. He reminded the committee that the Google group should be treated as a listserv where the membership list is maintained and the main committee communications tool is the Google site. The website is up to date.

Action Item: Cornick will update the website, Google group and site to reflect the new roster and actions and motions during the Montreal 2011 meeting.

10. **Handbook – Hugo Hens (for Holly Bailey, P.E. Handbook Chair)**

Hugo Hens went through a draft of a chapter for the Handbook that he has prepared. It was suggested that Dr. Chandra Sekhar be asked to review the chapter so far. Dr. Hens will review Hot and Humid Climate Design Guide and the Humidity Control Design Guide to see what can be included in the Handbook chapter. Hugo is looking for material that falls within the original outline. All members of the committee will try to send Hugo appropriate material. Hugo will try to send a draft of the chapter to Holly Bailey for editing and Holly will review and edit the draft by the middle of January. Lew Harriman obtained the text of the Air Force Guidelines and passed them on to Holly. He will also send the text to Hugo.

Action items:

All to send appropriate material for the Handbook chapter to Hugo by the end of July

Hugo to send Holly a draft of the Handbook chapter by the 15th December, 2011

Holly Bailey will review and edit the draft by the middle of January and make it available to the committee for review.

11. **Member's Comments – Jeff Traylor**

Jeff Traylor explained that due to health problems, Rodney Lewis will be taking a hiatus from ASHRAE activities for the foreseeable future.

12. **Mini-Presentation – Lew Harriman**

“Late-breaking news on mold, moisture management and human health”. Lew Harriman briefly summarized several new, and useful findings from the microbiologists and epidemiologists who made presentations at the International Indoor Air 2011 conference held recently (June 6-10, 2011) in Austin, TX. (Lew’s notes are attached to these minutes) The focus of the conference was on the ecology of buildings – the indoor biome. Some specific highlights included a report that one cause of asthma may be a fungal metabolite (triple-helix Beta-D Glucan) which results from mold digesting common building materials. The same fungus does not appear to produce the problematic triple-helix version of this metabolite when digesting naturally-occurring biomass in the outdoor environment.

Hugo Hens mentioned a report from National Academy of Sciences on indoor health and the impact of climate change.

13. Old Business – Ray Patenaude

The January 2011 action items listed in the table below were dealt with. Incomplete or ongoing action items were carried over along with any new action items from this meeting to the June 2011 list.

14. New Business – Ray Patenaude

- a. Lew Harriman will take over as Chair as of July 1st 2011
- b. By a standing ovation, the committee expressed its collective appreciation for the strong, creative and inclusive leadership of outgoing Chair, Ray Patenaude.
- c. We are looking for a 20 mini-minute presentation for Chicago.
- d. Roster and membership Chair Harriman will circulate the new roster to the membership so they can confirm their particulars.
- e. Larry Elkin expressed his desire to resign as Research Chair; Steve Cornick volunteered to take his place.
- f. Holly Bailey expressed her desire to resign as Handbook Chair; Hugo Hens volunteered to take her place.

Action item: Lew Harriman will circulate the new roster to the membership for review.

15. Adjourn – Motion to adjourn by Steve Cornick, Jeff Traylor seconded, meeting adjourned at 15:00 LST

Next meeting Chicago Illinois, Saturday 13:00 – 15:30 January 21st 2012

Action Items – June 2011

| WHO | ITEM | STATUS |
|---------------------|--|--------|
| Cornick and Gatland | Prepare for 1-hour brainstorm session for Chicago subcommittee research in 2012. | |
| Harriman | Lew will circulate the new roster to the membership for review. | |
| All | Send appropriate material for the Handbook chapter to Hugo by the end of July | |
| Hens | Hugo to send Holly a draft of the Handbook chapter by the 15th December, 2011 | |
| Bailey | Holly will review and edit the draft by the middle of January and make it available to the committee for review | |
| Cornick | Submit a seminar entitled “Mold, moisture management and human health” for Chicago | |
| Patenaude | Submit a seminar entitled “What does the HVAC engineer need to know about building enclosures?” for Chicago | |
| Avery | Submit a seminar entitled “Impact of ASHRAE Guidance on Moisture Management in Buildings” for Chicago | |
| Leslie | Submit a seminar entitled “Moisture management aspects of commissioning and integrated design?” for Chicago | |
| McGowan | Submit a Conference Paper Session: “Solving Moisture Problems Created By Energy Efficient Design,” for San Antonio | |
| Karagiozis | Submit a seminar entitled “International Case Histories on Moisture Management in Hot Climates” for San Antonio | |
| Bianchi | Submit a conference paper session: “Field Measured Values of Worldwide Indoor Residential Humidity” for San Antonio | |
| Harriman | Submit a seminar entitled “Building envelopes: real-world case histories in moisture management” for San Antonio | |
| Hens | Prepare a full-day training program on “What does the mechanical engineer need to know about building enclosures?” for San Antonio | |

Action Items – January 2011

| WHO | ITEM | STATUS |
|--------------|---|----------------------|
| All | Solicit research ideas from the committee membership, 3 each, collect and organize them and present them to the membership for evaluation by April 15th. Cornick will coordinate. | Complete |
| All | Review the references to moisture in the Handbook identified by Alex McGowan and comment. What is good or bad or missing | Complete |
| Cornick | Ask the members to send any FAQs, coordinate the activity, and report at the annual meeting in Montreal | Complete |
| Lew Harriman | Circulate the text of the Air Force guidelines | Complete |
| Hens | Prepare an updated rough draft of the proposed chapter for Montreal. | Complete |
| All | Comment on Hugo Hen’s draft posted on the Google site by May 1st | Complete |
| McGowan | Submit a forum entitled “What should be in a moisture management chapter in the ASHRAE Handbook?” for Montreal. | Complete |
| Patenaude | Submit a forum “Should ASHRAE develop a Standard on Building Enclosures” for Montreal. Chair: Patenaude | Complete |
| Eric Werling | Submit a Seminar entitled “New U.S. EPA Guidance for Moisture Control in Buildings” Chair Werling for Montreal | Dropped |
| Alex McGowan | Submit a Conference Paper Session: “Solving Moisture Problems Created By Energy Efficient Design,” Chair: Alex McGowan for Chicago | Moved to San Antonio |
| Gil Avery | A Seminar entitled “Impact of ASHRAE Guidance on Moisture Management in Buildings” Chair: Gil Avery for Chicago | Dropped |
| Bailey, Ron | Submit a seminar entitled “Update on ASHRAE’s Position Document on Mold” for Chicago. Ron Bailey Chair | Dropped. |
| Neil Leslie | Submit a seminar entitled “Moisture Management Aspects of Commissioning and Integrated Design” Neil Leslie Chair for | On-going. |

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|---------------------|--|-----------|
| | Chicago. | |
| Achilles Karagiozis | A Seminar entitled "International Case Histories on Moisture Management in Hot Climates" Chair Achilles Karagiozis for San Antonio | On-going. |
| Lew Harriman | A Seminar entitled "New Perspective on Mold in Buildings" Chair: Lew Harriman for San Antonio | Dropped |
| Marcus Bianchi | A Conference Paper Session: "Field Measured Values of Worldwide Indoor Residential Humidity" Chair: Marcus Bianchi for San Antonio | On-going. |

Minutes prepared by S. Cornick

Notes from Indoor Air 2011 - Austin, TX June 2011
Informal summary of a few key points of potential interest to TC 1.12

NOTE FROM LEW: These presentations lasted only 12 minutes each... it was very difficult to be certain I correctly understood the results presented in that amount of time! These notes may or may not be correct interpretations of what the speakers attempted to convey about these complex subjects in 12 minute presentations.
LewHarriman@MasonGrant.com

For additional information on many of these topics: <http://www.microbe.net/>

Herman Mitchell, Ph.D. - Rho Corp North Carolina

Many “sensitization thresholds” (Potentially problematic levels) for asthma now known. Actual sensitization much less, but becoming increasingly knowable and known through higher-speed, more comprehensive allergenic assays for building occupants. eg:

46% of households have levels of dust mite allergens which reach the threshold for humans, but only 27.5% of the population has in fact been sensitized

66% have threshold-level cat allergens, 17% of population have become sensitized

±30% of population has been sensitized to one or more indoor allergens. In dense urban housing (low-income) 50% have become sensitized. A very big number.

Mark Mendell, Ph.D, MPH - State of California Public Health (Epidemiologist)

Published comprehensive review in June - Dampness, Mold & Health

Still, no documented causation mechanism between dampness & health, but “associations” are stronger and stronger

All documented effects of damp buildings are negative health outcomes (no positive effect on health.. only negative)

Probably missing key variables for causation - unknown organisms and/or synergistic negative effects of many organisms.

Kathleen (Kay) Kreiss, M.D. NIOSH (Epidemiologist)

Extensive surveys show that “observational dampness” (visible mold growth, water stains and earthy odors) are the best predictor of negative health outcomes (as opposed to air sampling, or surface sampling) Negative effects appear associated with hydrophilic fungi (over 90% water activity) PLUS bacterial endotoxin.. not just one or the other.

Beta-D glucan an obvious trigger, produced by fungi.. especially dense in fungal fragments, which are smaller and more likely to be inhaled than spores, which also have less Beta-d Glucan

David Miller, Ph.D, MPH, CIH, Govt. of Canada

Very close to conclusive understanding causation (not just association) for asthma via fungal metabolites

Specifically, it’s probably “Triple-helical Beta-D Glucan”, which is only produced by fungus metabolizing building materials... (not food sources in the outdoor environment)

Size matters. Smaller fragments of hyphae contain more of this metabolite, and are also more likely to be drawn deeply into the lungs.

Very small exposures (much smaller than often found in buildings) have the ability to produce negative health effects, confirmed in the relevant “mouse models” (those pathways and mechanisms in mice, which have corresponded well in other studies to documented negative effects in humans)

Relevant concentrations of the triple-helix beta-d glucan, though exceedingly small, CAN be measured reliably with fluorescent techniques.

Implication: not all fungus of same species is equally hazardous, even when collected in the same space (indoor vs. outdoor food sources)

How to protect the public, based on what we now know? Public health forum - Mark Mendell (CA), Greg Recer (NY), Tobi Bernstein, JD Env. Law Institute, Carl Grimes, IAQA President -

Public outreach is the key - Keep buildings dry, period.

Tracey Woodruff, Ph.D, MPH, UC San Francisco, Public Health Epidemiologist

The age of the individual matters as much as the exposure. Negative effects are tied to specific times in human development.

eg: Breast cancer and DDT exposure. If over 14 at age of exposure.. no increased risk vs. general population. If UNDER 14 at age of exposure.. 40% greater risk than general population

Similar effects for testicular cancers and DiButylPthalate exposure... early exposure, or in utero exposure, far greater risks compared to risks of later post-puberty exposure.

Negative effects not immediately measurable.. only later. eg: BDE-4 (flame retardant) as high in children in CA as in workers in foam factories. Costs 2 to 8 points on IQ tests by adolescence... but cognitive effects not measurable earlier

Ventilation rates & acute health effects - ASHRAE task force (Not an investigation of either productivity effects or chronic health effects) - Jan Sundell, Hal Levin and health professionals

Documented beneficial health effects with increasing ventilation per person... up to 50 cfm/person (Above 50 cfm/person, no convincing documentation of health benefits)

Ventilation & headaches/drowsiness - Pawel Wargocki, Ph.D. Tech U of Denmark

Mechanism and cause of headaches and drowsiness almost certainly is “acidosis” - The backup of CO₂ in the bloodstream (increasing concentration) caused by inability to release CO₂ with unconscious response - “shallow breathing” in polluted indoor environments and in air higher than normal in CO₂ (“stuffy air”) Implication: high CO₂ concentration, currently thought to be just a marker of ventilation effectiveness, is probably an important pollutant in it’s own right, even in the typically low concentrations seen in schools and meeting rooms.

Dr. Peccia - Yale - Metagenomic analysis of indoor air (Sloan Foundation-funded)

Typical bioburden (exfoliation/exhalation) of bacteria & viruses is 10 to 15,000,000 per person, PER HOUR!

Allergenicity of known hazardous mold for those with open wounds and suppressed immune systems - Aspergillus Fumigatus - is higher when the mold is grown at lower temperatures than at higher temperatures (Those growing at 60-15°F are most allergenic... those at 95 to 100F are least allergenic)

Implication: Downstream of cooling coils may be the most worrisome

Implication: Not all aspergillus fumigatus will yield the same toxicity in testing.

Craig Venter, Ph.D. (The guy who first sequenced the human genome) - Metagenomic analysis of the outdoor & indoor environments - Collaboration between Sloan Foundation and Venter Foundation “Indoor Biome” investigations

Typical human contains:

20,000 genes of purely human origin

10,000,000 microbial genes - Far more bacterial and viral genes than “human” genes eg: more than 1,000 distinct organisms in your mouth.

Far more diversity found than expected in the outdoor environment. eg: 1 ml of seawater, taken from pretty much any location and any depth - 1,000,00 bacteria and 10,000,000 viruses

Indoor air quite a difficult environment compared to sea water (much less dense biomass and much more difficult sampling to ensure sterile baseline - equipment quickly contaminated by human-origin bacteria and viruses)

NYC indoor air

Human-origin rRNA predominates (Both uniquely human and “non-human-but-from-humans”) Next most prevalent is rodent-origin

“Other microbial” is 3rd

NYC outdoor air - Rodent is 1st, human is 2nd

Hospital air - Non-human, non-rodent (other microbial) is 1st, by far. (Hospitals generate lots of specialized microbes which do not survive in buildings or in the outdoors) houses.

Of viruses on human origin, the fecal viruses are by far the most common in both hospitals, and in homes

Identified to date in indoor air: 60,000,000 distinct genes (vs. 20,000 that are known to be of human origin) - A huge “parts kit” for assembly and recombination into living things through mutation and recombination (“infection”).

**TC 1.12 – Moisture Management in Buildings
Annual Meeting 24 June 2011 – Montreal QC
Agenda**

- 1. Call to order – Raymond E. Patenaude, P.E. – Chair**
- 2. Self-Introduction of members and guests**
- 3. Approval of minutes from Las Vegas meeting – Steve Cornick**
- 4. Review agenda**
- 5. Chairman’s report**
 - a. Report from the Chair
- 6. ASHRAE Mold Position Document – Lew Harriman**
 - a. Brief summary of the progress on the revision of the ASHRAE Mold Position Document
- 7. Research – Larry Elkin, P.E.**
 - a. Status update – Pool evaporation work statement (WS-1566) –Lew Harriman
 - b. Status update – DOAS design guide (WS-1565) - Lew Harriman
 - c. Research topic suggestions – Steve Cornick
- 8. Program – Alex McGowan, P. Eng**
 - a. Programs at the Montreal meeting
 1. Forum 1: What Should Be in a Moisture Management Chapter in the ASHRAE Handbook? Moderator: Alex McGowan P.Eng.
 2. Forum 10: Should ASHRAE Have a Standard on Building Envelopes? Moderator: Raymond Patenaude, P.E.
 - b. Proposed programs for Chicago
 - c. Proposed programs for San Antonio
 - e. Proposed programs for Dallas
- 9. Website/Google Group/Site – Steve Cornick**
- 10. Handbook - Holly Bailey, P.E.**
- 11. Action Items (see attached) – Ray Patenaude**
- 12. Member's Comments**
- 13. Mini-Presentation – Lew Harriman**

“Late-breaking news on mold, moisture management and human health”. Lew will briefly summarize several new, and useful findings from the microbiologists and epidemiologists who made presentations at the International Indoor Air 2011 conference held recently (June 6-10, 2011) in Austin, TX.
- 14. Old Business**
 - a. Old business – Ray Patenaude (Old chair)
- 15. New Business**
 - a. New Chair – Lew Harriman
 - b. 2011/2012 Roster – Lew Harriman
 - c. Other....
- 16. Adjourn**

Next meeting: Saturday 1:00 – 3:00 pm, January 21st 2012, Chicago, Illinois

TC 1.12
Moisture Management in Buildings
Research Subcommittee Report
10:00 – 12:00, June 25th, 2011
Hilton Bonaventure Montreal, Lower Level, Point-Aux-Trembles, Montreal QC
Submitted by: Lew Harriman, substituting for Larry Elkin (Research Chair) who could not attend

Status update – Pool evaporation work statement (WS-1566, developed by TC 8.10) – Status: According to RAC the problem described in the work statement has been oversimplified. RAC would like the TC to make work statement more comprehensive and more authoritative. RAC would also like the budget to be decreased at same time. TC 8.10 is going to redraft the work statement.

Status update – DOAS design guide (1565-WS) - Status: The work statement was approved for funding at the \$150K level and released for bid with 5 potential bidders and 3 strong contenders. No bids were received. The comments that Mike Vaughn received from the potential bidders was that they wanted to submit a proposal but there was not enough time to assemble the team to produce press ready file. The work statement will go out for re-bid in the fall.

Research topic suggestions – The request for research ideas was extended to the Montreal meeting. Three research topics were submitted for discussion. There were no other suggestions or discussion. Steve Cornick and Stan Gatland will conduct a 1-hour long brainstorming session at Chicago winter meeting during the research subcommittee meeting. A building pressurization RTAR by TC 1.8, posted on the TC Google site, was approved by RAC. They are looking for co-sponsorship and PMS members.

Action items:

1. **Action item:** Steve Cornick and Stan Gatland will prepare a 1-hour long brainstorming session for Chicago in January 2012.

TC 1.12
Moisture Management in Buildings
Handbook Subcommittee Report
9:00 – 10:00, June 25th, 2011
Hilton Bonaventure Montreal, Lower Level, Point-Aux-Trembles, Montreal QC
Submitted by: Hugo Hans for Holly Bailey (Handbook Chair) who could not attend

Hugo Hens went through a draft of a chapter for the Handbook that he has prepared. It was very well received by the attendees. Hugo stated that he needs help with the rest of the work especially for hot and humid climates. It was suggested that Dr. Chandrasakar be asked to review the chapter so far. Dr. Hens will review Hot and Humid Climate Design Guide and the Humidity Control Design Guide to see what can be included in the Handbook chapter.

There was some discussion of which Handbook the chapter should appear in; Fundamentals or Applications. Hugo is leaning more towards Fundamentals but the consensus was to get the chapter written first and determine where it belongs at a later date.

Hugo is looking for material that falls within the original outline. All members of the committee will try to send Hugo appropriate material by the end of July. Hugo will try to send a draft of the chapter to Holly Bailey for editing by the 15th of December 2011. Holly Bailey will review and edit the draft by the middle of January and make it available to the committee for review.

Holly Bailey has asked to step down as Handbook Chair. Hugo Hens has graciously volunteered to take over the position

Action items:

All to send appropriate material for the Handbook chapter to Hugo by the end of July)

Hugo to send Holly a draft of the Handbook chapter by the 15th December, 2011

Holly Bailey will review and edit the draft by the middle of January and make it available to the committee for review.

TC 1.12
Moisture Management in Buildings
Program Subcommittee Report
8:00am - 9:00am, June 25, 2011
Hilton Bonaventure, Salon Pointe-aux-Trembles, Montreal, QC
Submitted by: Alex McGowan, P.Eng. (Program Chair)

Montreal (June 25 – 29, 2011) Theme: Sustainability Knows No Borders

- i. Forum 1 “What should be in a moisture management chapter in the ASHRAE Handbook?” Chair: Alex McGowan (brought forward from Las Vegas – to be resubmitted for Montreal)
- ii. Forum 10 “Should ASHRAE Create a Standard on Building Envelopes?” Chair: Ray Patenaude
- iii. Seminar 26 “Prevention of Condensation in Mechanical Insulation Systems” Co-sponsor (with TC1.8)

Program activities planned for Chicago and San Antonio are as follows:

Chicago (January 21 – 25, 2012) Theme: High Performance Buildings, Integrated Design, Energy Modeling and Specialized Applications

Upcoming Program Dates

Conference Paper Abstract/Full Technical Papers due April 18, 2011
Conference Papers Submitted for Review are due July 8, 2011
Chicago Seminar and Forum Session Proposals are due August 12, 2011
Conference Website: <http://www.ashrae.org/chicago/>

- i. A Seminar entitled “Mold, moisture management and human health” Chair: Steve Cornick, with presentations by Eric Werling, Kay Kreiss, David Miller, Lew Harriman
- ii. A Seminar entitled “What does the HVAC engineer need to know about building enclosures?” Chair Ray Patenaude (proposed co-sponsor with TC4.2 , TC4.3 and TC4.4) will include presentations from Hugo Hens, Alex McGowan, Raoul Webb
- iii. A Seminar entitled “Impact of ASHRAE Guidance on Moisture Management in Buildings” Chair: Gil Avery will include presentations from Lew Harriman, Rodney Lewis/Ron Bailey, perhaps other speakers. This will be finalized in Montreal, but is to be presented in Chicago
- iv. A Seminar entitled “Moisture management aspects of commissioning and integrated design”? Neil Leslie Chair
 - a. Holly Bailey would present “The truth about integrated design” Design review does not stop at award of construction contract, but runs from cradle to grave. This includes the conceptual design, construction, commissioning, operation, and maintenance
 - b. Paul Shipp would present “Moisture management during construction”.
 - c. Ron Bailey would present “Moisture management aspects of control systems”
 - d. Additional input could be provided from Jeff Traylor in TC7.9

Seminars or forums not approved for the Chicago meeting will be re-visited for the San Antonio meeting.

ASHRAE has a paper option entitled Conference Paper, a shorter, single-blind review paper. Unsolicited technical papers are still an option for poster sessions.

San Antonio (June 23 – 28, 2012)

Upcoming Program Dates

Conference Site Live: June 20, 2011
Conference Paper Abstract/Full Technical Papers due September 26, 2011
San Antonio Seminar and Forum Session Proposals are due February 13, 2012
Conference Website: <http://www.ashrae.org/sanantonio/>

- i. A Conference Paper Session: "Solving Moisture Problems Created By Energy Efficient Design," Chair: Alex McGowan (seeking TC 4.4 co-sponsorship, and seeking authors from TC1.12 and TC4.4)
- ii. A Seminar entitled "International Case Histories on Moisture Management in Hot Climates" Chair Achilles Karagiozis (will include recent work by Fraunhofer IBP in Dubai, Leuven in Libya, and may draw other authors)
- iii. A Conference Paper Session: "Field Measured Values of Worldwide Indoor Residential Humidity" Chair: Marcus Bianchi
- iv. A Seminar entitled "Building envelopes: real-world case histories in moisture management" Chair: Lew Harriman, with presentations by Lew Harriman (historical retrofit), Alex McGowan (swimming pools), somebody on hot/humid climates

A full-day training program on "What does the mechanical engineer need to know about building enclosures?" provided by Hugo Hens