

**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, January 29, 2011** LOCATION: **Las Vegas Convention Center, Room N239, Las Vegas NV**

Minutes approved in at the annual meeting in Montreal June 2011

<b>MEMBERS PRESENT</b>	<b>TERM EXPIRES 6-30</b>	<b>MEMBERS ABSENT</b>	<b>TERM EXPIRES 6-30</b>	<b>EX-OFFICIO MEMBERS</b>
Raymond Patenaude	2011	Larry Elkin	2013	
Lew Harriman III	2012			
Steve Cornick	2013			
Holly Bailey	2011			
Hugo Hens	2013			
Andreas Holm	2012			
Achilles Karagiozis	2013			
Louis Kelter	2012			
Paul Shipp	2013			
Anton TenWolde	2012			
Jeff Traylor	2012			
Raoul Webb	2014			
<b>CORRESPONDING MEMBERS PRESENT</b>		<b>CORRESPONDING MEMBERS ABSENT</b>		<b>ADDITIONAL ATTENDANCE</b>
Mark Anderson		Fiona Aldous		David Christensen
Ron Bailey		Gil Avery		Gordon Hart
Marcus Bianchi		Stephen Barefoot		Hans Sedlbauer
Diana Fisler		Doug Bibee		Therese Stovall
Dale Herron		Leonard Damiano		Jason Teetaert
Hartwig Kuenzel		Claudio Darras		Lan Chi Nguyen Weeks,
Rodney Lewis		Andre Desjarlais		
Wahid Maref		Manfred Gerber		
Alex McGowan		Sam Glass		
		Michael Hayes		
		Carl Lawson		
		Mark Lawton		
		Neil Leslie		
		Him Ly		
		John Murphy		
		Albert Pucino		
		Mika Salonvaara		
		Ella Sterling		
		Dave Warfield		

		Bede Wellford		
		Theresa Weston		

## DISTRIBUTION

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

TAC Section Head:	Victor Penar
TAC Chair:	Charles Wilkin
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 26<sup>th</sup> 2010

Las Vegas Convention Center, Room N239, Las Vegas NV

**1. Call to order – Ray Patenaude – Chair**

Chair calls meeting to order at 13:00.

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

Introductions Those present introduced themselves, there were no liaisons present.

**3. Approval of minutes from Albuquerque meeting – Steve Cornick**

**Motion:** Jeff Traylor moved to accept the draft minutes from Albuquerque. Holly Bailey seconded. Motion carried (12, 0, 0, CNV).

**4. Review agenda – Ray Patenaude**

There were no changes to the agenda. Agenda approved. Agenda attached

**5. Chairman’s report – Ray Patenaude**

- a. *Report from the Chair:* The TC has made progress and will continue to do so. Some good was work done. There was however little interaction between members between meetings. There needs to be better communications between meetings. The TC is also attempting to be as paperless as possible.
- b. *Update on Google Groups.* – deferred to Agenda item 8.

**6. Research – Lew Harriman (Larry Elkin Chair)**

- a. *Status update – Pool evaporation work statement (WS-1566, developed by TC 8.10)*  
Status: According to RAC the work statement needs significant revision and rewording before turning it into a research project, the concern is that a lot of money is proposed to be spent and the feeling is that ASHRAE cannot afford this now and that the WS must be broken into small chunks. The concern about this however is that the problem might be broken up into chunks too small to deliver useful results. TC 8.10 is going to redraft the work statement.
- b. *Status update – DOAS design guide (1565-WS)*  
Status: The work statement was approved and made into a TRP and ready for bid.
- c. *Research topic suggestions*

Three research topics were submitted for discussion after the Albuquerque meeting. The request for research ideas will be extended to the Montreal meeting.

**Action item:** Everyone will submit 3 ideas to the TC Google site by April 15<sup>th</sup>. Cornick will coordinate the activity.

## 7. Program – Alex McGowan

- a. Programs at the Las Vegas meeting “*Zero energy design*”:
  1. Seminar 48 Cool New Tools for Finding and Fixing Problems in Buildings and HVAC Systems – Wednesday 8- 9:30 February, 2011 – Neil Leslie Chair
- b. Proposed programs for Montreal “*Net-zero Buildings*”(June 2011):
  1. Forum entitled “What should be in a moisture management chapter in the ASHRAE Handbook?” Chair: Alex McGowan (brought forward from Las Vegas)
  2. Seminar entitled “New U.S. EPA Guidance for Moisture Control in Buildings” Chair: Eric Werling (brought forward from Las Vegas)
  3. Forum entitled “Should ASHRAE Create a Standard on Building Envelopes?” Chair: Ray Patenaude
  4. TC 1.8 (Insulation for Mechanical Systems) seeks co-sponsor a seminar entitled “Prevention of condensation problems in mechanical insulation systems”
- c. Proposed programs for Chicago “*Impact of HVAC on our Everyday Lives*” (January 2012):
  1. Conference Paper Session: “Solving Moisture Problems Created By Energy Efficient Design,” Chair: Alex McGowan
  2. Seminar entitled “Impact of ASHRAE Guidance on Moisture Management in Buildings” Chair: Gil Avery
  3. Seminar entitled “Update on ASHRAE’s Position Document on Mold” Chair: Ron Bailey
  4. Seminar entitled “Moisture management aspects of commissioning and integrated design” Neil Leslie Chair
- d. Proposed programs for San Antonio (June 2012):

Themes have been discontinued for San Antonio

  1. A Seminar entitled “International Case Histories on Moisture Management in Hot Climates” Chair Achilles Karagiozis
  2. A Seminar entitled “New Perspective on Mold in Buildings” Chair: Lew Harriman
  3. A Conference Paper Session: “Field Measured Values of Worldwide Indoor Residential Humidity” Chair: Marcus Bianchi

For more detailed see the Program Subcommittee report, attached.

**Motion:** Alex McGowan moves that TC 1.12 cosponsor the seminar on Insulation problems with TC 1.8. and that the TC approve the remainder of the program plan. Holly Bailey seconded. Motion carried (12, 0, 0, CNV).

## 8. Website – Steve Cornick

- a. *Websites/Google group/Google site:*

Cornick gave a live demo to the committee on the use of the TC Google group and Google site. 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 will be the Google site. The website has been updated.
- b. *FAQ list:*

Cornick asked the committee if there any FAQs that could be posted to the FAQ page on the public website. There were none brought up at the meeting.

**Action Item:** Cornick will ask the members to send any FAQs, coordinate the activity, and report at the annual meeting in Montreal

**9. Handbook - Holly Bailey**

Alex McGowan has identified all the references to moisture in the Handbooks. These were circulated and have been posted on the TC's Google site.

**Action item:** TC members review the references and let us know what is good or bad or missing

Hugo Hens has drafted an outline of a possible chapter and raised some issues. The draft was posted on the TC's Google site.

**Action item:** TC members are to review and comment on the draft and the issues raised, especially the scope.

Lew Harriman has obtained permission for us to use the USAF "Air Force Moisture Guidelines."

**Action item:** Lew Harriman will circulate the text of the guidelines

**10. Member's Comments - Rodney Lewis**

Rodney gave a brief talk on "Condensation in Strange Places" about finding condensation on the exterior of the drywall in an air conditioned house in Houston. The item of interest was the length of time the design conditions are exceeded or nearly exceeded. He suggested that in Houston the conditions for mold growth in this particular situation would be about 1000 hours. Lewis will give a summary to TC 1.8 on the duct insulation portion.

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

"Web-based remote monitoring & trouble shooting of air barrier performance", a presentation by Jason Teetaert, P. Eng from SMT Research Ltd. was presented to the committee. Jason's company designs software and electronics used to monitor and evaluate the integrity and performance of commercial and residential buildings. The committee was specifically interested in the moisture and pressure monitoring equipment.

**12. Old Business – Ray Patenaude**

The June 2010 action items listed in the table below were dealt with here. Most of the action items were carried over along with any new action items from this meeting to the January 2011 list.

**13. New Business – Ray Patenaude**

- a. TC meeting mini-presentation topics for Montreal  
We are looking for a 20 minute presentation for Montreal.
- b. Roster and membership  
Except for Chair Patenaude rolling off after June 30 2011 and Lew Harriman taking over as chair the committee executive remains the same. Harriman will submit the rollover roster to TC section head.

**14. Adjourn – Motion** to adjourn by Chair Patenaude, Cornick seconded, meeting adjourned at 15:00 LST

*Next meeting Montreal Québec, Canada Saturday 13:00 – 15:30 June 25<sup>th</sup> 2011*

## 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.	On-going.
All	Review the references to moisture in the Handbook identified by Alex McGowan and comment. What is good or bad or missing	On-going.
Cornick	Ask the members to send any FAQs, coordinate the activity, and report at the annual meeting in Montreal	On-going
Lew Harriman	Circulate the text of the Air Force guidelines	On-going
Hens	Prepare an updated rough draft of the proposed chapter for Montreal.	On-going.
All	Comment on Hugo Hen's draft posted on the Google site by May 1st	On-going
McGowan	Submit a forum entitled "What should be in a moisture management chapter in the ASHRAE Handbook?" for Montreal.	On-going.
Patenaude	Submit a forum "Should ASHRAE develop a Standard on Building Enclosures" for Montreal. Chair: Patenaude	On-going.
Eric Werling	Submit a Seminar entitled "New U.S. EPA Guidance for Moisture Control in Buildings" Chair Werling for Montreal	On-going
Alex McGowan	Submit a Conference Paper Session: "Solving Moisture Problems Created By Energy Efficient Design," Chair: Alex McGowan for Chicago	On-going
Gil Avery	A Seminar entitled "Impact of ASHRAE Guidance on Moisture Management in Buildings" Chair: Gil Avery for Chicago	On-going
Bailey, Ron	Submit a seminar entitled "Update on ASHRAE's Position Document on Mold" for Chicago. Ron Bailey Chair	On-going.
Neil Leslie	Submit a seminar entitled "Moisture Management Aspects of Commissioning and Integrated Design" Neil Leslie Chair for Chicago.	On-going.
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	On-going.
Marcus Bianchi	A Conference Paper Session: "Field Measured Values of Worldwide Indoor Residential Humidity" Chair: Marcus Bianchi for San Antonio	On-going.

## Action Items – June 2010

WHO	ITEM	STATUS
Cornick	Make a tutorial movie on the use of Google groups for distribution.	Complete
Cornick	Solicit research ideas from the committee membership, 3 each, collect and organize them and present them to the membership for evaluation by April 15th.	On-going.
All	Review the references to moisture in the Handbook identified by Alex McGowan and comment.	On-going.
Hens	Prepare an updated rough draft of the proposed chapter for Montreal.	On-going.
Patenaude	Clarify the role of a cognizant committee on a position document, e.g. the mold position document, during a tech council review.	Report. Under purview of TEC council and PD committee
McGowan	Submit a forum entitled "What should be in a moisture management chapter in the ASHRAE Handbook?" for Montreal.	On-going.

Patenaude	Submit a forum "Should ASHRAE develop a Standard on Building Enclosures" for Montreal. Chair: Patenaude	On-going.
Bailey, Ron	Submit a seminar entitled "Update on ASHRAE's Position Document on Mold" for Chicago.	On-going.
McGowan	Submit a seminar entitled "Moisture Management Aspects of Commissioning and Integrated Design" for Chicago.	On-going.
McGowan	Submit a conference paper session: "Solving Moisture Problems Created By Energy Efficient Design," Chair: Alex McGowan (Seeking TC 4.4 co-sponsorship) for Chicago. Looking for TC 1.12 and TC 4.4 for paper authors.	On-going.

*Minutes prepared by S. Cornick*

**TC 1.12 – Moisture Management in Buildings  
Winter Meeting 2011 – Las Vegas NV  
29 January 2011 Agenda**

- 1. Call to order – Raymond E. Patenaude, P.E. – Chair**
- 2. Self-Introduction of members and guests**
- 3. Approval of minutes from Albuquerque meeting – Steve Cornick**
- 4. Review agenda**
- 5. Chairman's report**
  - a. Report from the Chair
  - b. Update on Google Groups – Steve Cornick
- 6. Research – Larry Elkin, P.E.**
  - a. Status update – Pool evaporation work statement (WS-1566)
  - b. Status update – DOAS design guide (WS-1565) - Lew
  - c. Research topic suggestions
- 7. Program – Alex McGowan, P. Eng**

Programs at the Las Vegas meeting - Seminar 48 *Cool New Tools for Finding and Fixing Problems in Buildings and HVAC Systems* – Wednesday 8- 9:30 – Neil Leslie

  - a. Proposed programs for Montreal .
  - b. Proposed programs for Chicago
  - c. Proposed programs for San Antonio
- 8. Website – Steve Cornick**
  - a. Google group/site
  - b. FAQ list
- 9. Handbook - Holly Bailey, P.E.**
  - a. Draft of MMB Handbook Chapter – Hugo Hens.
- 10. Member's Comments - Rodney Lewis, P.E.**
  - a. "Condensation in Strange Places"
- 11. Mini-Presentation – Lew Harriman**
  - a. "Web-based remote monitoring & trouble shooting of air barrier performance",  
by Jason Teetaert, P. Eng
- 12. Old Business**
  - a. Old business – Ray Patenaude
- 13. New Business**
  - a. TC meeting mini-presentation topics for Montreal – Ray Patenaude
- 14. Adjourn**

*Next meeting: Saturday 1:00 – 3:00 pm, June 25<sup>th</sup> 2011, Montreal Québec Canada*

**Action Items – January 2010**

<b>WHO</b>	<b>ITEM</b>	<b>STATUS</b>
Lew Harriman	Send TC comments to TC 8.10 and the 1566-WS authors.	Completed.
Steve Cornick, Ray Patenaude	Investigate and endeavor to setup a communications portal for the committee.	Completed
Steve Cornick, Ray Patenaude	Seek clarification of the role of the program subcommittee at TC Chairs breakfast and will report back.	Completed. CEC has no clarification as to the role of the program subcommittees in the current situation. Continue with status quo. Communication with the track Chairs is key.
Neil Leslie	Forward information to proposed session chairs.	
Ray Patenaude	Track the ASHRAE mold position document and report back to the committee in NM.	Completed
Ray Patenaude	Propose a forum on the EPA guidelines;.	On-going
Rodney Lewis	Give a mini-presentation to the committee on the mould position document in Albuquerque.	Postponed.
Alex McGowan	Circulate list of moisture related topics in the four ASHRAE Handbooks	
All TC 1.12	Check website	

**TC 1.12**  
**Moisture Management in Buildings**  
**Research Subcommittee Report**  
**8:00 – 10:00, January 28, 2011**  
**Las Vegas Convention Center, N239, Las Vegas, Nevada**  
**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 work statement needs significant revision and rewording before turning it into a research project, the concern is that a lot of money is proposed to be spent and the feeling is that ASHRAE cannot afford this now and that the WS must be broken into small chunks. The concern about this however is that the problem might be broken up into chunks too small to deliver useful results. TC 8.10 is going to redraft the work statement.

*Status update – DOAS design guide (1565-WS) - Status:* The work statement was approved and made into a TRP and ready for bid.

A couple of RTARs were circulated that seem to fall within the scope of TC 1.12.

The first was circulated by Len Damiano of TC 1.4 *Control Theory and Application* (see attached). The authors of the RTAR were looking for an indication of interest from the committee to sponsor (or cosponsor) the research described as on building and space pressurization methods, instruments and equipment. TC 1.4 and 4.3 have selected other projects during the last 2 years and have not elected yet to sponsor this project. It was noted that the RTAR assumes that buildings would be pressurized. Lew Harriman noted that building pressurization, while a common practice, is not always a logical response to either building energy or moisture management—in particular when dealing with cold climates.. Others noted that the amount of pressurization to achieve any particular purpose is not well-understood, and that the more important issue is probably the measurement and achievement of building envelope air tightness rather than the precision of the pressurization measurement over time. There was some discussion regarding interest in a RTAR regarding the purposes, benefits and costs of building pressurization but no conclusions were reached. Cornick will post the proposed RTAR in the research section of the TC's Google site for comment by the membership. Perhaps a project related to pressurization could be initiated between meetings or in Montreal.

A second RTAR, 1461 RTAR (co-sponsorship with TC5.5) Moisture storage in typical office buildings was passed on to Larry Elkin, Research Chair of 1.12. This is the second submission, RAC demanded co-sponsorship with TC4.4. It was deemed within TC 4.4 scope, but needs additional work. TC 4.4 decided that the project better fits better in TC1.12. No action was taken in Las Vegas by TC 1.12. Cornick will contact the authors of the RTAR, get copies, and post on the Google site for comment.

*Research topic suggestions –* Three research topics were submitted for discussion after the Albuquerque meeting. The request for research ideas will be extended to the Montreal meeting.

**Action items:**

1. Post Len Damiano's RTAT to the TC Google site (Cornick)
2. Contact 1461-RTAR authors, obtain copy, and post to TC Google site for comment (Cornick)

**TC 1.12**  
**Moisture Management in Buildings**  
**Handbook Subcommittee Report**  
**10:00 – 11:00, January 28, 2011**  
**Las Vegas Convention Center, N239, Las Vegas, Nevada**  
**Submitted by: Holly Bailey HandbookChair**

1. Moisture References in the Handbooks identified – Alex McGowan provided at the last meeting. ***We are requesting TC members review the references and let us know what is good or bad or missing – so that we can add those items to our list of what we need to consider for our new Chapter that we are working on.***
2. Hugo Hens' Outline / Draft of the upcoming chapter - Oct. 2010 was received. ***TC members need to review and comment on.***
3. Air Force Moisture Management Guidelines – Lew Harriman got them for us from Quinn Hart and we have permission to incorporate them into the chapter as we see fit.
4. Looking for a Co-Chair to assist in keeping things moving between meetings.
  - a. Jeff Traylor has volunteered – THANK YOU!
5. Handbook is trying to use Google Groups / Sites / docs –for discussion between meetings.
  - a. Please go there and look for the information we are asking for you to review and comment on.
  - b. I'm not great with it yet – but learning.
  - c. Some discussion occurred at the main meeting re: ideas for Handbook – I will try to put them on the Google Group/Site for discussion.

Holly Bailey [Holly@baileyeng.com](mailto:Holly@baileyeng.com) Handbook Subcommittee Chair

**TC 1.12**  
**Moisture Management in Buildings**  
**Program Subcommittee Report**  
**11:00 – 12:00, January 28, 2011**  
**Las Vegas Convention Center, N239, Las Vegas, Nevada**  
**Submitted by: Alex McGowan P.Eng. (Program Chair)**

**Program – Alex McGowan**

- a. *Programs at the Albuquerque “Energy Efficient System Design for High Elevations and Dry Climates” (June 2010)* – TC had two programs at Albuquerque;
  - i. Seminar 21 entitled “Odd Moisture Management Issues in Dry Climates,” Chaired by Neil Leslie
  - ii. Seminar 48 entitled “Solving Moisture Problems Created by Energy Efficient Design,” Co-sponsored with TC 4.4. and chaired by Alex McGowan.  
Both programs were well-attended, and generally received positive feedback,
- b. *Programs for Las Vegas “Zero energy design” (January 2011)* – TC had one session:
  - i. Seminar entitled “Cool New Tools for Finding and Fixing Problems in Buildings and HVAC Systems”  
Chair: Neil Leslie
- c. *Proposed programs for Montreal “Net-zero Buildings” (June 2011)* – The following sessions are proposed:
  - i. A Forum entitled “What should be in a moisture management chapter in the ASHRAE Handbook?”  
Chair: Alex McGowan (brought forward from Las Vegas)
  - ii. A Seminar entitled “New U.S. EPA Guidance for Moisture Control in Buildings” Chair: Eric Werling (brought forward from Las Vegas)
  - iii. A Forum entitled “Should ASHRAE Create a Standard on Building Envelopes?” Chair: Ray Patenaude
  - iv. We have a request from TC 1.8 (Insulation for Mechanical Systems) to co-sponsor a seminar entitled “Prevention of condensation problems in mechanical insulation systems”
  - v. A Forum entitled “Should ASHRAE code-intended standards include requirements for heat, air, and moisture management?” Chair: Ray Patenaude (Seeking TC 4.4 co-sponsorship) was discontinued
  - vi. A Forum entitled “Should ASHRAE certify moisture management engineers?” Chair: Larry Elkin was discontinued. There was lots of discussion – some don’t like certification, some prefer better education. Consensus: it might be better to have this one after we have developed some background material. F nobody is explicitly pushing for this, having the forum might implicitly endorse the idea, which we don’t necessarily want to do.
- d. *Proposed programs for Chicago “Impact of HVAC on our Everyday Lives” (January 2012)* – The following sessions are proposed:
  - i. A Conference Paper Session: “Solving Moisture Problems Created By Energy Efficient Design,” Chair: Alex McGowan (brought forward from Montreal – seeking TC 4.4 co-sponsorship, and seeking authors from TC1.12 and TC4.4)
  - ii. A Seminar entitled “Impact of ASHRAE Guidance on Moisture Management in Buildings” Chair: Gil Avery Lew Harriman, Rodney Lewis/Ron Bailey, perhaps other speakers. This will be finalized in Montreal, but to be presented in Chicago
  - iii. A Seminar entitled “Update on ASHRAE’s Position Document on Mold” Chair: Ron Bailey
  - iv. A Seminar entitled “Moisture management aspects of commissioning and integrated design” Neil Leslie  
Chair
- d. *Proposed programs for San Antonio (June 2012)* – The following sessions are proposed:
  - i. A Seminar entitled “International Case Histories on Moisture Management in Hot Climates” Chair Achilles Karagiozis
  - ii. A Seminar entitled “New Perspective on Mold in Buildings” Chair: Lew Harriman
  - iii. A Conference Paper Session: “Field Measured Values of Worldwide Indoor Residential Humidity” Chair: Marcus Bianchi