

**ASHRAE TC1.5 Computer Applications**

**Draft Meeting Minutes**

**Montreal  
2011 Annual Conference  
June 27, 2011**

These draft minutes have not been approved and are not the official, approved record until approved by this committee.

Revision 2: 19-Jan-2012

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.  
1791 Tullie Circle, N.E./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.: 1.5

TC/TG/TRG TITLE: Computer Applications

DATE OF MEETING: June 27, 2011

LOCATION: Montreal

**DISTRIBUTION:**

ALL MEMBERS OF TC

ALL COMMITTEE LIAISONS

# ASHRAE TC1.5 Activity Feedback Form

leave at JAC

## TC1.5

### TC/TG/TRG Activity Feedback Form

Please provide feedback on your TC/TG/TRG activities and return this form to your Section Head by email or drop off a printed copy in the Section Head's mailbox folder outside the ASHRAE Headquarters Room by Tuesday night 9:00 pm.

##	105	Committee Name: COMPUTER APPLICATIONS
		Chair: MICHAEL POUCHAK

Meeting was Held	(Day)	Monday	(Date)	JUNE 27, 2011
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Membership		
	Number Present	Total Number on Committee
Voting Members	8	9
Voting Non-quorum Members	0	0
Corresponding Members	<del>3</del> 13	38
Visitors and Guests	5	

**Major Committee Accomplishments/Challenges/Issues from this Meeting (Continue on separate page if needed)**

1. Approve Minutes
2. Announcements: Thank you letter to employers
3. Handbook: Entire committee is tasked to read Computer Applications chapter & return comments to TC1.5 HB Google Site page and HB chair
4. Research: RP1468 <sup>PMS</sup> well attended & on Track. Title is "Development of A Reference BUILDING INFORMATION MODEL (BIM) for Thermal Compliance Testing. Estimated Date of completion is August 31, 2011.
  - New RTARs for extension of Related BIM topics are being advanced. Information from 1468 findings - need way to publish the findings from RP1468.
5. Emerging Applications - Subcommittee discussed several new applications related to pervasive computing, feedback systems on comfort, & game theory apps
6. Programs Seminar 50: Simulation through Computer tool on Hist. Bldgs.

**Current Annual Committee Objectives and Status (see section 2.2.5 TC/TG/MTG/TRG MOP):**

Per Las Vegas TC1.5 resolution (Jan 31, 2011):

1. Enhance Communications among subcommittees and membership through the use of mailing list, web site, and collaboration tools.
2. Encourage the goals of efficient use of resources and society goals in sustainability by reduction of distributed paper & paperless meetings in TC activities.

Does Committee have Website on ASHRAE Server? YES URL if on another Server: \_\_\_\_\_  
 If so, is Website up to date? YES

Do you have special requests from your group for consideration by the Technical Activities Committee?  
NO

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## Attendance

### Attendance:

Name	Role	Em-App	Res	Prog	HB	T&P	Main 1.5 Mtg
<b>Voting Members</b>							
Mike Pouchak	TC 1.5 chair	X	X	X	X	X	X
Stephen Roth	Program Subcommittee Chair		X	X			X
John Kennedy	Research Subcommittee Chair		X	X			X
Xiaohui (Joe) Zhou	Emerging Applications Subcommittee Chair	X	X	X	X		X
David Branson	PMS 1468 chair		X	X	X	X	X
John Crosby					X		X
Walter Grondzik							X
Ron Nelson			X	X			X
<b>Corresponding</b>							
Mike Galler	TC 1.5 Vice Chair	X	X	X	X		X
Steven Rosen	Handbook Subcommittee Chair				X		X
Alison Kwok	Standards Subcommittee Chair						
Mark Hydeman	ALI Coordinator						
Bruce Billedeaux		X	X				
Norm Bourassa		X	X				
David Bornside		X					X
Benjamin Welle							X
Vikrant Aute		X	X		X		X
Charlie Culp			X				
<b>Guests</b>							
Andrew Mitchell		X					
Wayne Webster		X					
Simon Sansregret		X	X		X		X
Jocelyn Millette		X	X				
Alexander Tessier							X
Richard Simms							X
Roger Lautz							X

## Action Items

<b>Responsible Member</b>	<b>Description</b>	<b>Due Date</b>	<b>Completion Date</b>
Pouchak	Reserve Chicago Room locations	Jan 2012	Jun 2011
Pouchak	Chair to write letter to TAC to congratulate them on finally getting internet access.	Jun 2011	Jun 2011
-	-	-	-

## TC Minutes

### TC1.5 Computer Applications 2011 Annual Meeting Montreal

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**TC 1.5 Public Web site:** <http://tc15.ashraetcs.org/>

TC 1.5 ListServ (mailing list) :tc105\_all\_lst@listman.ashrae.org (contact chair or vice chair to be added)

TC 1.5 Members-only Site: <https://sites.google.com/site/ashraetc15/> (contact chair or vice chair for access)

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Monday, June 27, 2011, 6:30 – 9:00 pm ; **Hilton Outremont(Lower Level)**

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#### Call to Order

1. Approve Minutes from 2011 Winter Meeting in Las Vegas

Comments on 6c: Note that this overlaps in scope with TG1.Optimization.

Comment by Vikrant Aute

Grondzik makes Motion, Second by Crosby; Motion Carries 8-0-0 (Chair Voting)

Vic Penar - TAC Section-1 Head – Great job on the website. Thank you Mike P. for your help in helping others in setting up websites.

High Tower award – nominate by Sep 1<sup>st</sup> to Sec Head.

[www.ashrae.org/thankyouletter](http://www.ashrae.org/thankyouletter).

Next meeting in Chicago – High Performance Buildings.

Conf. April 18, Jul 8 Review, Seminar and Forums due Aug 27<sup>th</sup>.

Next in San Antonio

Sep 26 Conf. paper due, Sessions proposal dues by Feb.

Certificate to Mike P. in appreciation of his work as Chair of TC 1.5.

Review Action Items from 2011 Winter Meeting in LV – actions completed.

#### **Chairs Report**

Dinner Plans tonight – Three Brewers or Gibbys

Rosen made reservations at Gibbys.

#### **Announcements**

1)Reminders:2011-2012 roster now available. Copy will be circulated immediately after meeting.

Mike P – Ad Hoc committee has been formed to improve roster update process.

To view your roster, login to [www.ashrae.org](http://www.ashrae.org) site and select “my committees” ; You can also update your address and roster in the same area.

- 2) Tech Council committee on BIM - --has been converted by TAC into two MTGs as of July 1, 2011. The first MTG is called mtg.eec – energy efficient classification of general ventilation air-cleaning devices and the 2<sup>nd</sup> is called mtg.et – energy targets.
- 3)Multidisciplinary Task Groups (MTG):TAC approved two new MTG – Mike P. has details. ;The objective of MTG is to first try and better coordinate and focus the activities of the affiliated TC and non-TC groups (EHC,REF<SSPCs) so that the task can be completed as efficiently as possible.
- 4) Thank you letters to employers – in July, you will receive an email asking if you would like a thank you letter sent to your employer.
- 5) TAC keeps a list of interested members in serving as Sessions Chairs, Reviewers etc.
- 6)USGBC approval for continuing education.
- 7)– Aug 12, seminar proposals due for Chicago meeting.  
Conference papers will be judged solely by abstracts.
- 8)TC/TG website issues – contact Steven Rosen.
- 9)SC Chairs – please review your information/content on the TC website.
- 10)TAC+ECC – Webinar on how to maintain website using TC site template and ASHRAE servers.  
NVU editor for HTML pages scheduled this fall
- 11) Google sites for password protected areas.
- 12)Hightower award nomination. Due by September 1, 2011 – Outstanding technical leadership – link is <http://www.ashrae.org/technology/page/104>
- 13)Conferences – ECOST July 4<sup>th</sup>, 23<sup>rd</sup> Intl Cong. Ref. Aug 24, Prague,
- 14)Intl. Symp. On HVAC Nov in shanghai
- 15) TC 1.5 ListServ. : send email to [tc105\\_all\\_lst@listman.ashrae.org](mailto:tc105_all_lst@listman.ashrae.org)
- 16)Upcoming Programs  
Jan 21-25<sup>th</sup>, 2012, Chicago, high Performance Building, Integretred Design Eneryg Modeling and Specialized Applications. Seminar proposals due Aug 12<sup>th</sup>.  
Jun 23 – San Antonio. Deadlines announced.
- 17)ASHRAE high Perf. Building Conference – San Diego California.
- 18)Mike G. – TC 1.6 nearing completion, terminology will be available in Wiki format. Unified definitions of the terms.
- 19)SSPC 166 – Disbanding. Continue work using Wiki style website. It is preferred to use terms from the wiki but not required. Clearinghouse for terms and not a gatekeeper.

## ***Step up to the Plate***

Zhou – for agreeing to take on responsibilities to be the new vice chair/ secretary. Joe has been doing a great job running the Emerging Applications subcommittee.

## ***SC Reports***

### **Handbook -**

Steve Rosen – Not present at this time.

Mike-P Request – Every member is requested to read the computer applications handbook chapter. This considered by many people to be the most visible and valuable product of our committee. Many people read it. Would like to have comments from each member.



Feedback should be emailed to the SC chair and also posted on our google sites page.. We have 3 years to submit revision. Lets start now.

Grondzik – received a positive comment about the handbook. Need to have more cutting edge stuff.

## **Research**

John Kennedy – Presented SC chair report.

We had Subcommittee meeting yesterday. Focus was on RP-1468 status.

Dave Branson provided update on 1468. Project review meeting was well attended.

Contractor provided executive summary of the final version. Draft report by the end of August, final by Chicago.

Currently operating under a no-cost extension. Will wrap up final report by January meeting.

Request for no-Cost extension

The extension recommendation was unanimous from the PMS. A number of new project ideas and ongoing tasks have come out of this project.

Motion for extension – made by Dave B. Second by Stephen Roth. 8/0/0 Motion carries.

Current SOA for using geometry related parameters in energy modeling, yields gross differences.

Assumptions on geometry simplifications can have large implications – found by 1468.

Committee Discussion on new findings from RP-1468.

JFK – need to find a way to publish the findings from RP1468.

Idea – to write an ASHRAE Journal article.

We now have a draft Facebook page for TC1.5.

The url is:

<http://www.facebook.com/ASHRAETC1.5ComputerApplications>

JFK – ideas for renovation of existing buildings etc., opportunity for collaboration with Pittsburgh HUB, funded by DOE.

## **Emerging Applications**

SC Chair provides a report on meeting from yesterday.

Discussion on whether to include “Game Theory” in the revised scope of this SC.

Action Item: sent modified chapter and scope to Steve.

## **Program**

Stephen Roth, presented SC report.

Seminar 50 in this meeting, Wed morning at 8 am.

Cosponsoring 2 additional sessions, Wireless one and one MORE.

Presented Future Ideas:

**Motion by Stephen R.:** Cosponsor seminar for Chicago, on Mobile Apps for Load Calculations – Second by JFK. 8/0/0. Motion Carries.

TC Chair recommends reviewing to the session feedback for all sessions that the TC is responsible for.

## **Web Page**

TC Chair recommends that all SC chairs review their website content and the members review the TC1.5 website.

Remove all personal information (email addresses) since the society is moving in that direction.

Send comments to Mike G. and Steve Rosen.

## **T &P**

Dave B., SC Chair – presented update from Sunday meeting. Nothing more of significance to report.

Action Item for TC Chair – request a time slot for T&P time at the next meeting, on Sunday, 8-9pm, possibly for an offsite meeting.

## ***Liaison Reports***

**GPC 20 – Ben :** Presented report on GPC meeting earlier, Monday morning.

If TC 1.5 members are interested in more info, send email to the liaison.

**IAI/BIM –** No report

**Others –** New Handbook chapter on Smart Building coming out. Some of the content overlaps with a section in TC1.5 chapter.

BIM Technology Committee – Looking to make an online accredited course out of the design guide. The design guide document needs further review. Not well attended.

## ***New Business***

Stephen Roth – has ASHRAE approached our TC to improve membership?

New Student feedback – The meeting booklet is loaded with acronyms and had to spend 6 hours to find his schedule in the meeting book.

There should be an app to find out what's going at a given time.

The meeting booklet does not encourage new members to attend.

TC should have a representative who goes to the mixer to introduce our TC and encourage them to attend.

There is an entire community of young professionals (not students) who also needs to be encouraged.

TC will forward the comments to the creators of the meeting booklet. Honest and Open feedback.

## ***New/Old Business***

### ***Other***

NA

Next Meeting in Chicago

Mike G – Motion to Adjourn, Second by Branson. Motion Carried 8-0-0 (Chair voting)

*Notes taken by Vikrant Aute, deputized assistant to Mike Galler Vice-Chair/Secretary*

## Attachment 2: Agenda

### AGENDA

ASHRAE 2011 Annual Conference – Montreal

### TC 1.5 Computer Applications

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**TC 1.5 Public Web site:** <http://tc15.ashraetcs.org/>

TC 1.5 ListServ (mailing list) : 'tc105\_all\_1st@listman.ashrae.org' (contact chair or vice chair to be added)

TC 1.5 Members-only Site: <https://sites.google.com/site/ashraetc15/> (contact chair or vice chair for access )

#### Main Committee Meeting

**Monday 6:30-9:00 p.m.**

**Hilton Outremont(I)**

Sponsoring : Seminar 50: Modeling the Past to Maintain the Future: Sustaining Historic Buildings Through Computer Tools

1. **Call to Order**
2. **Welcome – Introductions**
3. **Roll Call** – List of Voting members from 2010-2011 1.5 Roster: Pouchak, Roth, Kennedy, Zhou, Branson, Crosby, Grondzik, Nelson;
4. **Review of Agenda**
5. **Approval Of Minutes from 2011 Winter Meeting in Las Vegas**
6. **Review Action Items from 2011 Annual Meeting in Las Vegas**
7. **Chair's Report**
  - a. Dinner plans
  - b. Announcements
  - c. Step-up-to-the-plate awards
8. **Subcommittee Reports**
  - a. Handbook – *Steven Rosen*
  - b. Research – *John Kennedy*
  - c. Emerging Applications – *Xiaohui Zhou*
  - d. Program – *Stephen Roth*
  - e. Web Page – *Steven Rosen*
  - f. T&P – *Dave Branson*
9. **Liaison Reports**
  - a. GPC-20
  - b. IAI/BIM Society Subcommittee Report
  - c. Others
10. **Old Business**
11. **New Business**
12. **Next Meeting Times** – Chicago Jan 21-25 , 2012
13. **Adjournment**

## TC 1.5 Meeting Schedule

### TC 1.5 Computer Applications (25/25)(Screen)

**Monday 6:30-9:00p (H) Outremont (L)**

*Sponsoring: Seminar 50: Modeling the Past to Maintain the Future: Sustaining Historic Buildings through Computer Tools*

### TC 1.5 Emerging Applications (6/10)

**Sunday 5:00-6:00p (H) Fundy (L)**

### TC 1.5 Research (15)

**Sunday 6:00-7:00p (H) Fundy (L)**

### TC 1.5 Program (15)

**Sunday 7:00-8:00p (H) Fundy (L)**

### TC 1.5 PMS 1468

~~Old: Monday 4:15-6:00p (H) St. Laurent (L)~~ : NOTE CHANGE! New time: Sunday 10:15-12:00 in the Fairmont, Hochelaga

### TC 1.5 Handbook (15)

**Monday 6:00-6:30p (H) Outremont (L)**

### TC 1.5 Programs Schedule

Wednesday, June 29, 2011, 8:00 AM-9:30 AM

#### **Seminar 50 (Basic)**

**Modeling the Past to Maintain the Future: Sustaining Historic Buildings through Computer Tools**

*Track: Engineering Tools*

*Room: Lasalle*

**Sponsor: 01.05 Computer Applications, Historical Committee**

*Chair: Tim Dwyer, Fellow ASHRAE, University College London, London, United Kingdom*

The global challenge for maintaining and developing a sustainable built environment in the coming decades is from the 95%+ of buildings that are already here. This session provides real experiences of applying modern modeling techniques to historic buildings as a means of developing designs that preserve the past as well as ensuring a viable future.

#### **1. Applying Computational CFD to Design Air Flow in Archeological Church of Christ in Cairo, Egypt**

**Essam Khalil, Ph.D., Fellow ASHRAE, Cairo University, Cairo, Egypt**

This presentation shows how 3D Computational Fluid Dynamics (CFD) model was used to assess the airflow characteristics in the archaeological Church of Christ (hanging Church) in Cairo, Egypt. The objective was to optimise the air movement and relative humidity by properly locating the supply diffusers and extract ports to not only maintain comfort conditions but to ensure that the wall paintings were not degraded by the airflows. The outcome from the study and how the use of CFD studies enable sympathetic and sustainable design of ventilation systems is presented.

#### **2. Revealing Design and Construction Challenges of Historical Buildings During BIM Creation**

**David Branson, P.E., Member, Compliance Services Group, Inc., Lubbock, TX**

Significant building elements can become hidden over time, only to be rediscovered during building information model (BIM) development as part of a renovation project. Documentation of these findings can be critical, and often are quite time consuming. Several of the speaker's experiences with BIM development on projects that involve buildings of historical significance will be examined, and some considerations will be offered to aid in successful project completion.

#### **3. The Actual Reality of Predicted Energy Modeling for Historic Toronto Building**

**David Clark, Member, Stantec, Toronto, ON, Canada** 77 Wychwood Barns was built in Toronto in 1913 as a streetcar service garage, and is an important example of local, historical, industrial architecture. Abandoned until 2008, a local community partnership was formed to re-develop the site to provide affordable live/work studios for artists and community spaces for the arts. Key aims included community engagement, heritage preservation, and sustainable recognition (including aiming to become the first historic building in Canada to attain LEED® Gold Certification). The building's energy use was modeled as part of the MEP design and David will present the lessons learned from actual performance following a year of occupancy.

Wednesday, June 29, 2011, 8:00 AM-9:30 AM

# *Emerging Applications Subcommittee Meeting Minutes*

ASHRAE 2011 Summer Meeting – Montreal, Quebec, Canada  
**TC 1.5 Computer Applications Emerging Application Subcommittee**

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**Sunday June 26<sup>th</sup>, 5:00pm -6:00pm (Hilton) Fundy (L)**

**1. Call to Order:**

- a. Meeting started @ 5:05pm

**2. Welcome – Introductions:**

- a. Participants:

Vikrant Aute

Bruce Billedeaux

David Bornside

Norm Bourassa

Mike Galler

Jocelyn Millette

Andrew Mitchell

Mike Pouchak

Simon Sansregret

Wayne Webster

Xiaohui Zhou

**3. Review of Agenda**

- a. No change on the agenda

**4. Approval of Minutes from Previous Meeting**

- a. There are discussions on whether “Game Theory”, which models strategic situations in mathematics, is relevant to HVAC applications and should be included in the scope for Emerging Applications. “Game theory” was added at the last meeting when discussing about the modified scope for this subcommittee and one participant suggested but she is not available for this meeting. Some members argue it may be relevant as users’ feedback and response to building automation system may be optimized using this. Zhou recommended still leave this in the modified scope for this subcommittee.

**5. Review Action Items from Previous Meeting**

- a. Zhou has sent the modified Charter and Scope for this committee to webmaster but it seems not updated yet on the TC 1.5 Emerging Applications subcommittee website. Will send again and ask webmaster to update.
- b. Pouchak's RTAR about collecting user feedback using social voting mechanism need to reduce scope of work and number of people involved with this as this may overlap with another RTAR from Operation and Maintenance TC
- c. John Crosby is not present. Need update about the on-line collaboration server and the seminar proposal status: Integrated Project Delivery – I do found there is a seminar on “Integrated Project Delivery: A Case Study” from TC 7.2 that is scheduled for Montreal meeting. Need update on potential RTAR: Generative design of energy modeling – rule based parametric design.
- d. Steve Roth is not present. Need update on draft of RTAR on Creating BIM for HVAC equipment.
- e. Zhou: Two technical papers (co-authored with Prof. Ron Nelson) were accepted for ASHRAE Transaction: “A Plug and Play Framework for Air Handling Unit and Temperature Sensor Auto Recognition Technique, Part I and Part II”. Presentation will be given on Wednesday Technical Paper session #8 8:00am ~ 9:30am.

#### 6. **New Business**


- a. TC 1.5 co-sponsored forum “Incorporating Acoustics into BIM” is scheduled in Montreal meeting (Wednesday 9:45~10:45am)
- b. New ideas about using embedded microprocessors / micro sensors for HVAC applications. Pervasive computing concept. Future research or seminar?
- c. Discussion on distributed supervisory control – collecting HVAC system data remotely on a central server via internet, then use data mining / AFDD / optimization techniques to run at server side to detect faults or send back optimal setpoints.
- d. Zhou introduced a project at the Iowa Energy Center to optimize HVAC energy using a data mining approach to build HVAC system data model and use optimization technique to change AHU supply air temperature and static pressure setpoints. Initial result shows 30% energy savings. Will try to apply for a seminar in Chicago.

7. **Next Meeting Time** – January 21 - 25, 2012 at Chicago, IL

#### 8. **Adjournment**

- a. Meeting ends at 6:00pm

*Subcommittee minutes submitted by Xiaohui Zhou*



# *TC 1.5 Handbook Subcommittee Meeting Minutes*

ASHRAE 2011 Annual Meeting – Montreal

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**Monday 6:00pm -6:30pm (Hilton Bonaventure) Outremont (Lower Level)**

**Minutes:**

**Call to Order at 6:10pm by S. Rosen**

**Welcome – Introductions**

**Roll Call – Attendance:**

Steve Rosen – Chair, Dave Branson, Mike Galler, John Crosby, Mike Pouchak

**Review of Agenda**

**Approval of Minutes from 2010 Summer Meeting – Motion by Dave B, 2<sup>nd</sup> by Mike G - Approved unanimously.**

**Review Action Items from 2010 Summer Meeting – Done.**

**New Business**

- ✚ Chair to contact ASHRAE staff concerning continuous maintenance.
- ✚ 7.5 Smart Building Systems will contact chair to have their section placed in their own chapter.
- ✚ Mike P. proposed a timeline be created and posted.
- ✚ Mike P proposed all members to post comments on existing computer applications chapter.

**Next Meeting Time** – Monday, June 27, 6:00pm -6:30pm, Montreal

**Motion to adjourn by Mike P., 2<sup>nd</sup> by Vikrant A. meeting adjourned at 6:25pm.**

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Agenda:

1. Call to order
2. Welcome – introductions
3. Roll Call
4. Review of Agenda
5. Approval of Minutes from 2011 Winter Meeting
6. Review Action Items from 2011 Winter meeting
7. Chairs Report
8. New Business

*Subcommittee minutes submitted by Steve Rosen*

# *TC 1.5 Program Subcommittee Meeting Minutes*

ASHRAE 2011 Annual Meeting – Montreal

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## **TC 1.5 Computer Applications Program Subcommittee**

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**Sunday June 26<sup>th</sup>, 7:00pm -8:00pm (Hilton) Fundy (L)**

**Minutes:**

Stephen Roth, presented SC report.

Seminar 50 in this meeting, Wed morning at 8 am.

Cosponsoring 2 additional sessions, Wireless one and one MORE.

Presented Future Ideas:

Other issues: Cosponsor seminar for Chicago, on Mobile Apps for Load.

**Discussion on** session feedback on recent programs.

*Subcommittee minutes submitted by Stephen Roth*

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# *TC 1.5 Research Subcommittee Meeting Minutes*

ASHRAE 2011 Annual Meeting Montreal

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## **TC 1.5 Research Subcommittee**

**Sunday June 26, 2011 6:00pm -7:00pm , Hilton : Fundy Room – Level Lower**

### **Research**

Reviewed Agenda

Subcommittee chair presented report.

We had SC meeting yesterday.

RP-1468 status-

Dave B. – provided update on 1468. Project review meeting attendance.

Contractor provided executive summary of the final version.

PMSC feedback due by July 15.

Contractor to provide final report to PMSC by August 31.

Contractor to request no-cost extension to January 31, 2012.

PMSC to provide comments to contractor by December 15.

Final Report to be presented at ASHRAE winter conference.

Motion for extension needed by main TC 1.5

Current SOA for using geometry related parameters in energy modeling, yields gross differences.

Assumptions on geometry simplifications can have large implications – found by 1468.

Committee Discussion on new findings from RP-1468.

RP-1468:Development of a Reference Building Information Model (BIM)

for Thermal Model Compliance Testing

September 2009-January 2011; Texas A&M University;

Principal Investigator, Mark J. Clayton;

TC 1.5, Computer Applications

*Subcommittee minutes submitted by John Kennedy*