ASHRAE 2019 Winter Conference – Atlanta, GA
TC 1.5 Computer Applications- DRAFT Minutes

TC 1.5 Public Web site: http://tc0105.ashraetcs.org/
TC 1.5 basecamp: https://basecamp.com/2681208/projects/8192590

Main Committee Meeting	**Monday January 14**	**B319**
	6:30-9:00 PM	

1. **Welcome: Meeting Called to Order at 6:33 PM**

   Roll Call: Determine if required number of Voting Members are present to reach Quorum

   Members Present: Stephen Roth (Chair), Joshua New, Jeff Franklin, **Carol Lomonaco, Bruce Billedeaux,** Mohammad Heidarinejad, Dan Macumber, Mark Adams, Tarek Rakha, Shichao Liu, Edward Tsui, Krishnan Gowri, Mick Schwedler, Eric Garrison, David Branson, Mike Pouchak, Patrick Carpenter, Artem Zhukov, Dane Christiansen, Todd Gottshall

   Members Absent: Michael Galler, John Crosby

   Quorum Achieved. 4 of 6 present

2. **Review of Agenda:**

   No comments on recommended revisions or updates.

3. **Approval of Minutes from 2018 Annual Conference in Houston, TX:**

   Stephen Roth moves to approve previous meeting minutes, Joshua New seconds, passes 4/0/0

   Joshua New notes that only 6 are listed as voting members in the ASHRAE website. Mike Pouchak confirms 6 is the official number of voting members. Stephen Roth confirms that he has updated to 10 but is not reflected in the website.

4. **Action Items**

   Stephen Roth – confirm voting member status is updated in the ASHRAE website

   Bruce Billedeaux – review galley proof of the heavily-revised Handbook chapter

   Stephen Roth – submit new title and scope for the TC

   Stephen Roth – add Dan Macumber to Basecamp once officially accepted as a provisional or corresponding member.

   Stephen Roth – will email out the Word document on basecamp to everyone on the TC. Word document is located here: https://3.basecamp.com/3106353/buckets/4362382/uploads/1529810900

   Stephen Roth – will post a collaborative discussion chain in basecamp; any individual forms should be sent to Sarah rather than Stephen.

   Mike Pouchak and Dan Macumber – work together to update website meeting times and meeting minutes to post as a 1-time deal

   Joshua New, Mohammad Heidarinejad, Bruce Billedeaux – agree to contribute to future ideas for a given technology

5. **Amir Jokar – Section Head**

   No updates.

6. **Subcommittee Reports:**

   Emerging Applications Report (Appendix A)

   Mark Adams filling in for Anthony Fontanini

   54 attendees at MBEM, Part 10 (1.5 co-sponsored)

   Kaggle competition with Chris Balbach going to TAC regarding IP rights, subcommittee is supportive

   Urban-scale energy modeling, Joshua New to ask Ron Judkoff to submit parts 11 and 12

   Lots of discussion around social media technologies, data privacy ownership, rights

   Work statement related to occupant behavior (Bing Dong)

   Drone discussion, commercial aspects may surpass us as a community. Tony Fontanini or Mark Adams to be contacted for interest in forming seminar

   Discussion of 3D printed buildings which incorporates HVAC ductwork, etc.

   Program (Appendix B)

   Bruce Billedeaux provides Program subcommittee update.

   Tomorrow is Seminar 47 that TC 1.5 is co-sponsoring

   3 programs due Feb 8:

   - Carol Lomanaco – Commissioning with Cybersecurity in Mind
   - Tim Dwyer – Blockchain (NREL's Dane Christiansen)
   - Krishnan Gowri – Predictive Analytics (LBNL for FDD)

   Cannabis seminar; TC4.1 wants to do a part 2 in Kansas City

   Seminar 10 – what's new in cybersecurity, 70-100 people

   Research (Appendix C)

   Todd Gottshall provides Research subcommittee update.

   RP-1801 BIM development author and contractor is Rob Hitchcock, going well

   RP-1810 BIM-to-BEM interoperability test cases, executive session after this meeting with PES to put forth recommendation to committee; Stephen Roth author

   WS-1811 Occupancy from social meeting data mining; Bing Dong author; submitted to RAC and will review in March along with MTG-OBB sponsorship

   WS-1815 Integrating occupancy into simulation, Rob Hitchcock author; TC1.5 and MTG-BIM co-sponsoring, led by MTG-OBB, both TCs have voted out and would like to get a final TC1.5 vote.

Todd calls for vote to support "Occupant Behavior Data into Building Performance Simulation." Stephen Roth seconds.

Discussion: Lomanaco wants our RAC liaison to see these before RAC. Todd says he's had the opportunity to see it.

Passes: 4/0/0 chair voting.

ASHRAE Research Stats:

- $160k average cost
- 900 projects since 1959 with combined cost over $76 million.
- RAC developing webinars for PMS training.

Mike Pouchak recommends the "Project Monitoring Subcommittee" training that oversees a research project and coordinates with the contractor in the execution of a project.

Research Publication – for user manuals or guidelines to be called PTAR will be used to fund publications.

RAC meets MMAD – March, May, August, and December 15. Mike Pouchak recommends not waiting until the last day to submit.

People interested in serving on RAC, TAC, Handbook, and Standards can be nominated via the ASHRAE website.

Handbook (Appendix D)

Krishnan Gowri provides Handbook subcommittee update.

Chapter was updated, voted, and passed in December. Should receive galley print in March before it goes out. Took 30-35 page chapter and brought it down to 10-12 pages. Krishnan asks for a galley proofreader that is a fresh pair of eyes.

Bruce Billedeaux volunteers. AIbb – review galley proof

Cybersecurity (Appendix E)

David Branson provides Cybersecurity subcommittee update in Mike Galler's absence (due to travel cancellation from government shutdown).

Meeting yesterday afternoon was fairly well attended. Discussion of maturation of the cybersecurity field, how it's being deployed in governmental projects, how affecting industrial projects.

Mick mentions that it'd be good to coordinate with TC 2.10 since they have "Security" in their title. Carol Lomanaco serves on that TC. TC 2.10 Chair is Jason DeGraw, Vice-Chair is Carol Lomanaco.

7. **YEA update:**

David Branson provides YEA update in Lindsey King's absence.

Lindsey King discusses is very active and has a strategy to help YEA members land with involvement to TCs. College of Fellows for establishing mentoring connections for YEA.

TC1.5 has 2 YEA members in the room.

8. **Chair's Report:**

Lindsey King went to the Chair's meeting.
   a. Review goals for my 2-year term (are these reasonable, yet a bit aggressive?):
      i. At least 4 sponsored or co-sponsored seminars/workshops per meeting
      ii. At least 1 new RTAR and WS per meeting
      iii. At least 3 new TC 1.5 members per meeting. In fact, since the last meeting we have 5 new members:

      Parastoo Delgoshaei
      Dane Christensen
      Nilesh Deshpande
      Eric Nordstrom
      David Stephens
      Dan Macumber (signed up in subcommittee meeting)
      Perhaps 1 other

      iv. Sponsor or co-sponsor at least 1 new standard during the 2-year term
      v. Rename our TC
      Name change voted on already. Would like to review and vote on new scope along with the name change regardless of a merge.
      Krishnan Gowri asks if section head, Amir Jokar was supportive of Stephen Roth.
      Title: Computer Applications -> Emerging Technology Applications
      Scope:
      Eric Garrison attended because this TC was the only one that mentions computer or software.
      Stephen Roth motions we approve the "TC1.5 is concerned with emerging technologies and software applications for the design and optimization of the built environment." Joshua New seconds.
      Discussion:
      Passes 4/0/0 chair voting

   b. ASHRAE reorganization
      Letter - https://3.basecamp.com/3106353/buckets/4362382/uploads/1529754568

      290 meetings to decrease to 30 new TCs (from 110), 180 TC subcommittees aren't going away but may be reduced. Plan is to have seminars in the morning and all TCs are happening in the afternoon.
      ASHRAE would like feedback within 60 days so they can develop a plan and implement it by Orlando, FL.

      Discussion:
      • Mark Adams feels hard to get people involved if subcommittee meetings are only online
      • Joshua New expresses understanding of more meetings (room overhead) and less conference attendance (less registrations).

- Mike Pouchak believes that larger TCs will be more intimidating and less likely to encourage involvement.
- Carol Lomanaco joined someone who led an effort in connected buildings which is not as intimidating when more capable people that have 10+ years left are already participating
- David Branson is afraid this is another StarTrek issue – to boldly go where no man has gone before; what other organizations have tried this? Bruce mentions this has been tried by ISA and ISO.
- Bruce Billedeaux believes a lot of time must be set aside for everyone to make presentations to bring everyone up to date and harmonize work between committees.
- Carol Lomanaco was involved with ISA, moved twice as fast as ASHRAE, on phone every Thursday, librarian hired and paid out of dues, March to November had a report completed
- Joshua New notes people are resistant to change but believes we should move faster and break things. Looking at optimal hierarchical group size would be beneficial. Liaisons between TCs may help in the combinations.
- Patrick Carpenter looked at historical data from 18 years ago, few sections have more, some less, not 10% different (maximum number per section). Up or down 1-3.
- Dane Christiansen: lot fewer rooms, more registering and attending the conference (more research), can find smaller venues to open number of cities we can meet at.
- Mick Schweidler: first issue is using our volunteer's time wisely (cost reductions would be a nice side effect but are not a driving factor; less communication challenges)

 c. Setting expectations for upcoming members:
  i. Make sure to remind voting members that they will be committed for 2 years
  ii. Make sure they understand the responsibilities of the position

 d. Present dinner plans – ~11 people

9. **Liaison Reports**

None.

BIM MTG (Multi-Disciplinary Task Group) is the longest-running MTG since 2011. Supposed to convert to Technical Resource Group (TRG) and eventually a Technical Committee (TC).

10. **Old Business**

Mike Pouchak says that draft minutes have to be posted within 60 days. Mike Pouchak will work with Dan Macumber to post it as a 1-time deal.

11. **New Business**

None.

Stephen Roth motions to adjourn, Edward Tsui seconds. All approved.

12. Next Meeting Times**:** ASHRAE Annual Conference, June 24, 2019 – Kansas City, MO

Appendix A. Draft - TC 1.5 Computer Applications Emerging Application Minutes

Sunday, Jan 13, 5:00 pm - 6:00 pm

GWCC, 2nd Floor, Building B, B208

Chair: Mark Adams, adamsmb@ornl.gov, 865-574-7687

Filling in for

Anthony D. Fontanini, anthony.fontanini@nrel.gov, 720-527-9786

•Call to Order – 5:00 PM

Attendance:

Name	Present?	Voting Status	Committee Position
Stephen Roth		Yes	CHAIR/SECRETARY/STANDARDS SUBC CH
Lindsey King		Yes	VICE CH/PROGRAM SUBC CH
Joshua New	X	Yes	Secretary EMERGING APPLICATIONS SUBC CH
Todd Gottshall	X	Yes	Research Subcommittee Chair
John Crosby		Yes	
Michael Galler		Yes	Webmaster Cybersecurity Subcommittee Chair
David Branson	X	Yes	Member
Michael Pouchak		Yes	Member
Bruce Billedeaux	X	Yes	Member
Carol Lomonaco		Yes	Member
Time Dwyer	X	Yes	Member

Non-voting attendance: Mark Adams, Dan Macumber, Bob Coleman, Daisy An, Emma Oneto, Luke McCarthy, Edward Tsu

•**Chair's Report**

•Welcome old and new attendees and encourage participation.

•**Review of Action Items and Activities from previous meeting**

- Program Review for this meeting:

Seminar 16 - Urban-Scale Energy Modeling, Part 8
Date and Time: Sunday, June 13th, 11:00 am – 12:30 pm
Track: Fundamentals and Applications
Room: GWCC, Building A, A408
Sponsors: 4.7 – Energy Calculations and 1.5 - Computer Applications

Chair: Ron Judkoff, National Renewable Energy Laboratory, Golden, CO

1. Evaluating the Impact of the Urban Context on Building Energy Modeling, Xuan Luo, *Lawrence Berkeley National Lab, Berkeley, CA*

2. Modeling Zero Net Energy Communities, Daniel Macumber, *National Renewable Energy Lab, Golden, CO*

3. AutoBEM Capabilities for Creating a Digital Twin of a Utility, Joshua New, *Oak Ridge National Laboratory, Oak Ridge, TN*

Seminar 57 - Multiscale Building Energy Modeling, Part 9
Date and Time: Tuesday, June 15th, 11:00 am – 12:30 pm
Track: Fundamentals and Applications
Room: GWCC, Building A, A408
Sponsors: 4.7 – Energy Calculations and 1.5 - Computer Applications
Chair: Joshua New, Ph.D., Oak Ridge National Laboratory, Oak Ridge, TN

1. Modelling London's Building Stock and its Associated Energy Use, Paul Ruyssevelt, Ph.D., *University College London, London, United Kingdom*

2. Using Regional Building Modeling for Energy Forecasting, David Shipley, *Posterity Group, Ottawa, ON, Canada*

3. Wide-area 3D Imaging Using Foliage-penetrating Laser Radars for City-scale Building Evaluation, Eric Statz, *MIT Lincoln Laboratory, Boston, MA*

4. Building Modeling and District System Optimization at Scale, Peter Ellis, *Big Ladder Software, Denver, CO*

•**New Business (brainstorming)**

Creating a Kaggle Completion - Building Calibration/Prediction Robo-shootout

Follow up with Clayton Miller about Kaggle competition

IP rights, issues

Chris Balbach tried to get TAC to sponsor, Kaggle makes money off google cloud competitors use, cloud AI instead

Research project –

•   Urban-scale building energy modeling

Macumber – IES, Big ladder: commercial products for urban-scale energy modeling

New – Asking Ron to submit part 10 and 11

•   Social media technologies

Macumber – data privacy rights for building occupants

Bruce Billedeaux - Edge data, building owner know when you are there and what you are data

- Tim - GDPR, RFID in ASHRAE badge

  Utility, load shed, demand reduction in thermostat, etc

- Modelica language and functional mockup units (FMUs)

  New - Prototype of integration, refrigeration fluids properties additions

- Drones

  Commercial aspects are moving faster

  Duct inspection with micro drones

  Construction progress is standard use of drones

  Drone data to Building Energy Model, automatically

  New - LBNL using drones to gather building properties, EIA or CBECS virtual audits aerial imagery

  Micro drone to gather data in large atrium, temperature etc

  New – provide names to drones, THVEOZ, CEO… drones for good

  Try to provide drone seminar

- Additive manufacturing / 3D printing

  Adams – Marines 3D print concrete barracks in 40 hours, compared to 10 Marines in 5 days to build out of wood. Many research labs around the world are 3D printing buildings from various materials. Autodesk has mobile large-scale AM in a shipping container to print custom parts on-site.

  Wood construction techniques into concrete buildings

  How is HVAC incorporated and added in, electrical, etc

- Mobile applications

- Web-services

- Big data modeling/mining

  Find someone to show controls, big data mining

- Virtual and Augmented Reality

- Artificial intelligence

- Open Discussion

Application areas that are of interest to this subcommittee as they apply to the HVAC industry include but not limited to:
- Advanced Design Tools
- Contracting and Business
- Education and Training
- Engineering Design Productivity
- HVAC System, Equipment, and Component Optimization
- Operating Procedures and Diagnostics

Examples of current computer technologies that are of interest to this subcommittee include:

- Augmented Reality, GPS & GIS Application
- Building Information Modeling (BIM)
- Blockchain
- Cloud-based Computing
- Data Exchange and Interoperability
- Game Theory
- HVAC Applications for Smart Phones and Tablet Computers
- HVAC System Modeling Using Data Mining and Knowledge Discovery
- Optimal Control Using HVAC System Model based on Data Mining Approach
- Multi-disciplinary Design Optimization
- Multimedia
- Virtual Reality / Virtual BIM

- **Meeting Action Items**

- **Next Meeting Time**

  June 24, 2019 – Kansas City, MO, USA

- **Adjourn –** 6:00 pm

APPENDIX B. TC 1.5 Computer Applications Programs Meeting Minutes

Jan 14, 2019
Georgia World Congress Centre, Atlanta, GA

Not available

APPENDIX C. TC 1.5 Computer Applications
Research Meeting Minutes

Jan 14, 2019
Georgia World Congress Centre, Atlanta, GA

Not available

APPENDIX D. TC 1.5 Computer Applications
Handbook Subcommittee Meeting Minutes

Jan 14, 2019
Georgia World Congress Centre, Atlanta, GA

1. Meeting Called to Order at 6:00 p.m.

2. In attendance – Krishnan Gowri, Subcommittee Chair; Bruce Billedeaux

3. Chapter final draft was completed and approved by TC (electronic vote in Dec. 2018).

4. All the following topics were covered :
    Cloud computing, mobile technologies, big data, HVAC applications, Systems design, component design

5. Thanks to the following contributors:
    a. Cyber security – Mike Pouchak
    b. Big data – Dave Branson
    c. Cloud computing – Krishnan Gowri
    d. Mobile applications – Lindsey King
    e. EMCS applications – Todd Gottshall
    f. BIM and interoperability – Rob Hitchcock and Supriya Goel

6. Meeting Adjourned – 6:01 p.m.

Appendix E. TC 1.5 Computer Applications
Cybersecurity Meeting Minutes

Jan 14, 2019
Georgia World Congress Centre, Atlanta, GA

Not available