

ASHRAE 2017 Annual Conference – Chicago, IL

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 22

Salon 10

6:30-9:00 PM

1. Welcome: Meeting Called to Order at 6:32 PM

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

Members Present: Stephen Roth (Chair), Todd Gottshall, Joshua New, Dave Branson, Bruce Billedeaux, Carol Lomonaco

Members Absent: Mike Galler; John Crosby

Lindsey King: Needs to recuse herself as voting member. 2 JCI employees as Voting Members on Roster. Chair needs to fill out emergency roster change after meeting.

Quorum Achieved.

2. Review of Agenda:

No comments on recommended revisions or updates.

3. Approval of Minutes from 2017 Annual Conference in Long Beach:

Dave moved to approve, Carol Seconded, unanimously approved. Long Beach Minutes Unanimously approved.

Action Item – Stephen Roth to all ensure previous minutes posted online.

Action Item - Joshua New contact Mike Galler, download basecamp minutes, rename, send to Mike Galler, make sure they are uploaded

4. Action Items

Action Item – Joshua New to notify Tony Fontanini of his appointment; Stephen Roth will notify Amir Jokar once he accepts.

Action Item – Dave Branson to submit documentation to ASHRAE to establish the ASHRAE Cybersecurity GPC.

Action Item – Mike Galler and Carol Lomonaco - write narrative about pertinent points of NIST SP 800-53 Rev. 4

5. Amir Jokar—Section Head

Amir Jokar notifies Stephen Roth that things appear to be going well

Lindsey King commented : Joslyn Ratcliff should be contacted for Stephen Roth to be granted access to the meeting minutes.

Amir recommends one of the leaders attend the meeting Tuesday at 11am.

6. Subcommittee Reports:

Emerging Applications Report (Appendix A)

Joshua New provides Emerging Applications subcommittee update.

TC1.5 sponsored seminar “Urban-Scale Energy Modeling, Part 7” had Luke Leung and Duncan Phillips presenting on challenges for modeling tall buildings. The seminar was well-attended with over 80 participants.

Action – Roth to ensure new subcommittee attendees are added to Basecamp.

Joshua New was recognized for his service as subcommittee chair . Discussed urban-scale energy modeling, social media technologies, modelica, drones, big data mining, virtual/augmented reality, and artificial intelligence. Some ideas feed into research and programs subcommittees.

Joshua New requests appointment of new EA subcommittee chair. Notifies chair that Anthony Fontanini volunteered first and then Mark Adams. Stephen Roth appoints Anthony Fontanini as new Emerging Applications subcommittee chair.

Program (Appendix B)

Bruce Billedeaux provides Program subcommittee update.

Stephen Roth expresses goal of having 4 seminars/workshops sponsored or co-sponsored at each ASHRAE conference, which requires ~6 to be submitted.

For this conference: a drones seminar involving a research, businessman, and FAA legal council was rejected. Seven new program ideas were generated.

- Carol Lomonaco – “cybersecurity consults – what they do.”
- “Bitcoin for HVAC – blockchain to explore security in HVAC”
- Joshua New – “Urban-Scale Energy Modeling, Part 8”
- Bruce Billedeaux – “Creating 3D models with Drones”
- Google Nest data point through voice commands
- Carol Lomonaco – Jeopardy game on cybersecurity
- Carol Lomonaco – Co-sponsorship opportunity with BACnet tagging (SSPC223)

Action item: Bruce Billedeaux will follow-up with all of these this week since the items are due 2/9.

Research (Appendix C)

Todd Gottshall provides Research subcommittee update.

Research chair breakfast – MMAD (March May August December) are the due dates to remember for research proposal deadlines, gave out \$1-2 million last year for research.

Todd will meet/discuss with Professor Kato, who is our research liaison; Todd does get his feedback.

Mike Pouchak commented on changes in research manual; Todd will review the training material and attend the workshop in May.

Rob Hitchcock got a work statement approved. Todd Gottshall requests a PES training packet. PES has been assigned for this approved work statement.

Todd Gottshall was recognized In Chicago for ASHRAE Award of Engineering Excellence for his work on the San Francisco Museum of modern art.

RTARS and work-statements in process:

- WS1810 - Stephen Roth addressed comments, Krishnan mentions BIM MTG is co-sponsoring. This work statement creates test cases for gbxml to improve schema by providing a mechanism for software developers to ensure they import and export in the proper format. Certified for gbxml if they pass the 20 tests. This is a follow-on to research project RP-1468.

Todd motions for TC1.5 to submit WS1810, David Branson seconds. Discussion:

David Branson makes comment that there's a difference between unanimous or majority win; you almost have to have a unanimous vote from TC for RAC to move forward. Jeff Haberl worried that we're doing level 3 validation, but only doing geometric. Krishnan: can't validate auto-zoning. Mike Pouchak proposed comments be documented in writeup.

Vote to submit WS1810 passes unanimously: 6/0/0

- Joon-Ho has an RTAR draft (Facial skin temperature-driven thermal comfort model) that involves processing camera imagery to determine thermal comfort of occupants.

David Branson moves TC1.5 submit the RTAR, Tom Gottshall seconds. Discussion:

Krishnan Gowri asks: who is the contractor to do the work because we need at least 2 candidates. Andrei-Claudius – already doing that with 30 subjects, thermal, 3D, and vision imaging for skin temperature over time so analyzing the data.

Vote to submit RTAR passes unanimously: 6/0/0

- Rob Hitchcock has an RTAR approved by RAC that is ready for development into a work statement. Sponsored by MTG Occupant Behavior, RAC recommended co-sponsorship by TC1.5. Rob Hitchcock failed to have work statement ready for this meeting and asks that TC1.5 consider cosponsoring. Integrating Occupant Behavior Data into BIM for Performance Simulation. Stephen Roth asks: what's the typical workflow? Rob says that occupancy data would be collected on thermostat setpoint changes, operable windows, etc. Rob Hitchcock will revisit co-sponsorship by TC1.5 when he has a work statement. Rob Hitchcock expresses opinion that March submission may be overly optimistic, but that it may be ready by May. Question on whether this will be for an individual person being tracked. Rob Hitchcock says it could be used that way but several methods listed for detecting occupant behavior that could be rolled into the data format.
- Bing Dong has a work statement submitted to RAC and returned with comments. Bing Dong is working on the work statement and will share when he can.
- Todd Gottshall plans to assemble an RTAR for blockchain. Todd speaks to applications of blockchain to HVAC for decentralized trust. Carol Lomonaco recommends use cases and simulations.

Handbook (Appendix D)

Krishnan Gowri provides Handbook subcommittee update.

Chapter 40 is up for update in 2019, deadline is March 2019 (for committee in May) and there has been little progress so far. There was a decision to meet bi-weekly from now until May to revise/update the Chapter with a plan to revamp and remove old information (8 pages will be removed by referencing CPU, printer, etc.). Only 4-5 attending handbook meeting so Krishnan solicits for other participants to contact him. Bi-weekly meetings are scheduled to start at 11am PST on February 2.

Mike Pouchak discussed best practices for collaboratively editing a document. Internet Explorer-only support for ASHRAE's collaborative editing software is noted as a limitation.

Cybersecurity (Appendix E)

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

Tim Dwyer reported that CIBSE has not made progress on the liaison report and that an article be circulated to CIBSE once the ASHRAE Cybersecurity GPC has been formed.

There was significant discussion on what the focus of this newly-formed subcommittee should be. Potential liaison with other efforts include TG2, TC7.5, TC1.4, GPC13, SSPC135, BIM MTG, and CIBSE.

Action Item – Dave Branson to submit documentation to ASHRAE to establish this GPC

Action Item – Mike Galler and Carol Lomonaco - write narrative about pertinent points of NIST SP 800-53 Rev. 4

7. YEA update:

David Branson and Lindsey King provide YEA update.

Lindsey King discusses how she is working to develop a roadmap that outlines how YEA members can become more fully involved in TC meetings.

Joshua New recommends assisting TC Secretaries since they have the heaviest workload and YEA members would be more engaged (esp. regarding minutes for subcommittee meetings) and thereby learn the activities and process of ASHRAE.

David Branson has no YEA update; Lindsey King has been involved. YEA trying to recruit from happy hour, but will be seeking a list of open positions on TCs where YEA members can serve. David Branson been involved in the College of Fellows for establishing mentoring connections for YEA. Krishnan was at Saturday afternoon mixer for student activities that was well-attended. Krishnan recommends shadowing and assisting as opportunities.

8. Chair's Report:

100% compliant website and 1 new YEA member will be added

9. Liaison Reports

None.

10. Old Business

None.

11. New Business

ASHRAE Exchange was asked to be stricken at the last meeting.

Mike demonstrated text search feature in basecamp . You can search search basecamp text files directly or download entire directory and search PDF for all PDFs in directory.

Steve Rosen – Standards, not here to report

Krishnan recommends Stephen Roth assign Rob Hitchcock as liaison

Mike Galler – Webmaster, not here to report

Virtual reality – Lindsey king requests contacts

Todd Gottshall and David Branson are rolling off now, Mike Pouchak recommends not leaving today until replacements are found, Lindsey also needs to be replaced. Krishnan Gowri volunteers to roll on as voting member.

Votes are conducted to down-select all options to the top 5 with votes. Plan is to post on basecamp for more feedback with final selection by voting members.

Stephen Roth motions to adjourn, Lindsey King seconds. All approved.

12. Next Meeting Times: ASHRAE Annual Conference, June 25, 2018 – Houston, TX

Version 4 5/16/18

Appendix A. Draft - Meeting Minutes

ASHRAE 2018 Winter Meeting – Chicago, IL

TC 1.5 Computer Applications Emerging Application Subcommittee

Sunday, January 21, 5:00-6:00p

Madison

Chair: Joshua New, newjr@ornl.gov, 865-241-8783

- Call to Order – 5:00 PM

Attendance:

Name	Present?	Voting Status	Committee Position
Stephen Roth	X	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	X	Yes	Member
Bruce Billedeaux	X	Yes	Member
Carol Lomonaco		Yes	Member

Non-voting attendance: Tom Pollard, Antonio Lewis, Ryan Seo, Mitchel Paulus, Lei Wang, Jonathan Ingram, Athony Fontanini, Reinard Seidl, Artem Zhukov, Kevin, Dunshee, Jie Li, Mark Adams, Joon-Ho Choi, Tim Dwyer, Jeff Haberl

- **Approval of Minutes from Long Beach 2017 winter meeting**

No revisions to the Long Beach Minutes recommended. Draft approved.

- **Chair's Report**

Welcome old and new attendees and encourage participation.

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

- ASHRAE has moved to a standardized and update website which has your TC membership info in the "Participation" section of your profile (requires login). Please consider updating your biographical information by logging into <http://www.ashrae.org>.

- 0 Carol Lomonaco requested corresponding member status with TC1.5 in Long Beach, and has now been made a full member.
- ASHRAE Distinguished- and Exceptional-Service Awards (DSA/ESA). Template form for calculating points from publication and involvement are available upon request.
- ASHRAE is generally moving to basecamp, which allows posting of documents, creation of text documents, and to-do lists. TC1.5 basecamp - <https://basecamp.com/2681208/projects/8192590>
 - TC1.5 has moved to Basecamp 3
 - Encourage TC to create new templates/ideas/concepts for prototypes, projects, proof-of-concepts, etc., and give full access to all members
- 2 seminars accepted for this conference:
 - Urban-Scale Energy Modeling, Part 7**
Track: Tall Buildings
Room: Adams
Sponsor: TC 1.5 Computer Applications, TC 9.12 Tall Buildings, TC 4.7 Energy Calculations
Chair: Joshua New, Ph.D., Member, Oak Ridge National Lab, Oak Ridge, TN
 - 1. Micro Environemnt in City of Chicago and Impacts to UBEM**
Luke Leung, P.E., Member, Skidmore, Owings, & Merrill LPP, Chicago, IL
 - 2. Sources of Errors in the Physical and Computational Modeling of Wind in the Urban Realm**
Duncan Phillips, Ph.D., P.E., Associate Member, RWDI, Guelph, ON, Canada
- **New Business (brainstorming)**
 - Consideration of ASHRAE Technology Council Chair

TO: Jim Vallort, Technology Council Chair
 Claire Ramspeck, Technology Council Staff Liaison

FROM: Mick Schwedler, PEC Functional Planning Subcommittee Chair

DATE: December 5, 2016

SUBJECT: PEC Recommendations for O&M Initiatives to Support ASHRAE's New Strategic Plan

PEC assigned PEC's Functional Planning subcommittee MBO# 5, A- "Identify product needs & prepare implementation roadmap for O&M market focus." In response, the subcommittee submitted **PEC O&M Ideas to Support ASHRAE's New Strategic Plan** Report to the council at the 2016 ASHARE Annual Meeting in St. Louis. There were several recommendations including suggestions for groups to be responsible for implementation. The committees reporting to Technology Council have been highlighted in yellow.

Please let me know if you have any questions.

10. ASHRAE should explore how the new virtual reality programs could be used to support the O&M market. **(Request assign to TC 1.5, Emerging Technologies)**

Ideas:

O&M – see duct temperatures

See performance, CFM, and performance of different equipment in the mechanical room

Make design changes for real-time visualization of architecture

Make design changes to ducts, grab, pull, connect

Commissioning – making sure everything is where it should be; alignment of equipment with the as-designed plan

BIM-to-AR

USC – thermal conditions in chamber, show IR in VR to see visualization of building model with end-user control

Servicing equipment like virtual surgical operations

Contacts:

Any companies or contacts that we know are working on this?

Larry Brackney (NREL) not interested (fiducials used long ago)

Jamison Daniel (ORNL) willing to present

Matterport – O&M solution, tag on each piece of equipment (embedded URL)

Surgical operations – Bruce Billedeaux

Research project –

- Urban-scale building energy modeling

Joshua New discusses ORNL, NREL, and MIT work

- Social media technologies

Comfy, renamed from Building Robotics, (UC-B) – people vote on thermostat

Tony Fontanini – crowd comfort, small application to download, if building is covered, you can do the same type of comfort; building operations and maintenance pictures also, streamlines maintenance for F&O, 90-min report time to 10-min reporting and time

Mining for occupancy

Jeff points out money for this is important for fire protection, smoke, acoustics, contaminants, and other issues

- Modelica language and functional mockup units (FMUs)
 - Joshua New discusses Modelica's mechanism for cyber-physical simulation, the basis for DOE's future simulation tool Spawn-of-EnergyPlus (SOEP) and Minimum Viable Product (MVP) with self-contained executable with virtual machine that can run JModelica with all libraries to simulate a building, slow runtime so ORNL work in FY18 on runtime
 - Jeff says there is a mismatch between physical simulation of buildings and the cutting edge

0 AIjn – follow-up with Amir Roth

- Drones
 - Seminar fell through on what the FAA rules are; commercial user of drones, and a drone researcher chaired by Joshua New. David Branson resubmitted, but rejected.

0 Jeff recommends staying on that; drones have taken over construction for the university. 14 out of 17 voted yes. 155 slots and already 155 submissions for Houston.

- Web-services
- Big data modeling/mining
 - Bruce: Validating data off the smart meters
 - Jeff: smart meter data smart? What data is being collected or missed?
 - Targeting old refrigerator and HVAC through NILMs
 - Convex Labs.io – predictive maintenance through social network, satellite data, purchased data
 - Joshua New discusses ORNL research on supercomputer-based simulation of buildings with 64x speedup (Applied Energy)
 - Joshua New discusses 281-4,617 variables statistical analysis with impacts on energy, peak-demand, and converting to monetary savings
 - Joshua New discusses the multi-lab Exascale Computing Project (ECP) coupling models for population, transportation, buildings, and socioeconomics to run on high-performance computers including Titan (nation's fastest), Summit (ORNL's new 200TF machine coming online), and ANL's exascale machine
- Virtual and Augmented Reality
 - 2016 release of Facebook's Oculus Rift, Playstation VR, HTC Vive, Samsung Gear VR, Amazon's Homido, Microsoft HoloLens, Fove VR, Zeiss VR One, Avedant Glyph, Razer OSVR, Freefly VR, Google Cardboard; MagicLeap coming out this year (fully-contained)
 - 2017 – market reports seem disappointing

- Artificial intelligence

0 Joshua New appointed to the U.S. President's [National S&T Council's Machine Learning and Artificial Intelligence](#) Subcommittee's [Artificial Intelligence Consortium](#)

The Future Computed: Artificial Intelligence and its role in society – new free book by Microsoft

Bill Pulse automatically labeling measurement data.

- 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)
- 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

- **EA Subcommittee Chair**

Tony Fontanini

Anyone else wish to volunteer? No.

- **Next Meeting Time**

Jun. 23-Jun. 27, 2018 – Houston, TX

- **Adjourn** – 9:13 pm

APPENDIX B. TC 1.5 Subcommittee Meeting, Programs

Chicago, IL, January 21, 7:00 to 8:00 pm

Palmer House Hilton Floor 3; Madison

Chair: Michael Galler, mikeg@nist.gov

1. Call to Order at 7:05 pm
2. Attendees: Bruce Billedeaux, Ryan Soo, Carol Lomonaco, Stephen Roth, Jie Li, Kevin Donshee, Mark Adams, Joon-Ho Choi, Joshua New, Todd Kwao-Yovo
3. Approval of Minutes from Long Beach 2017 deferred till Houston
4. Reviewed the Agenda
5. Discussed current programs (Submitted 3 program proposals in all and 2 were accepted, 1 was rejected):

Monday, January 22, 9:45 AM - 10:45 AM

Seminar 27

Urban-Scale Energy Modeling, Part 7

Track: Tall Buildings

Room: TBD

Sponsor: 1.5 Computer Applications, 9.12 Tall Buildings, 4.7

Chair: Joshua New, Ph.D., Member, Oak Ridge National Lab, Oak Ridge, TN

Development of urban-scale building energy models is becoming increasingly tractable for many applications including city-wide energy supply/demand strategies, urban development planning, electrical grid stability, and urban resilience. This seminar has assembled several researchers with capabilities in the field of urban-scale energy models to discuss an overview of the field as well as the data, algorithms, workflow, and practical challenges addressed in their applications involving creation of useful models of individual and tall buildings at the scale of a city, urban, or metropolitan area.

1. Micro Environment in City of Chicago and Impacts to Ubem

Luke Leung, P.E., Member, Skidmore, Owings, & Merrill LPP, Chicago, IL

2. Sources of Errors in the Physical and Computational Modeling of Wind in the Urban Realm

Duncan Phillips, Ph.D., P.E., Associate Member, RWDI, Guelph, ON, Canada

Monday, January 22, 11:00 AM - 12:00 PM

Workshop 3

ASHRAE Building Energy Quotient: A Building Rating System and More

Track: Fundamentals and Applications

Room: TBD

Sponsor: 1.5 Computer Applications, Building EQ Committee

Chair: Bill Klock, P.E., Member, EEA Consulting Engineers, Austin, TX

ASHRAE is in the process of introducing an updated version of Building Energy Quotient (Building EQ). A web portal for data entry and building energy evaluation is coming online in Fall 2017. This workshop gives an overview of the Building EQ rating system, explains the web portal a bit, and talks about some of the marketing initiatives being taken to promote this rating system to building owners and other interested parties.

1. The Methodology of Building EQ

Charles Eley, P.E., BEMP, Member, Eley Consulting, San Francisco, CA

2. A Discussion of the New Building EQ Web Portal

Stephen Roth, P.E., Member, Carmel Software Corp., San Rafael, CA

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6. List of proposed seminars not accepted:

Drones in HVAC

7. Houston 2018 Program Details:

a. ASHRAE Annual Conference, Houston TX | June 23 – 27, 2018

b. Deadlines

- Feb 9th Seminar, Forum, Workshop Proposals Due
- Program submittal website: www.ashrae.org/Houston

c. Drone seminar will be resubmitted by Dave Branson.

d. Tracks

Track 1: HVAC&R Systems and Equipment

Track Chair: Frank Schambach

Email: frankschambach@mindspring.com

Selection of equipment and systems is paramount to HVAC&R design. Papers and programs in this track will assist designers, engineers, and operators in the design, selection, and operation of HVAC&R systems and equipment.

Track 2: Fundamentals and Applications

Track Chair: Dennis Alejandro

Email: denzjac@yahoo.com

Fundamentals are the foundation for understanding applications in engineering. Key components of ASHRAE fundamentals include thermodynamics, psychrometrics, fluid and mass flow. This track provides opportunities for papers and presentations of varying levels across a large topic base. Concepts, design elements and shared experiences for theoretical and applied concepts of HVAC&R design are included.

Track 3: District Energy and Cogeneration Plants

Track Chair: Kimberly Pierson

Email: kdpwildcat@gmail.com

As our world resources become more and more sparse there is an industry-wide movement toward efficiency and sustainability. One of the ways in which we can look to minimize our carbon footprint is to combine our resources. District energy systems and cogeneration plants do just that and are quite popular in some locales but have yet to gain traction in other developed cities. We will look at the advantages and limitations, do's and don'ts and best practices of utilizing this type of shared system.

Track 4: Safeguarding your HVAC&R System

Track Chair: Rich Rose

Email: richr@mticontrols.com

From seismic events to power outages and human error, how secure is your HVAC&R System? Mechanical, plumbing, electrical, and control systems all work together to create our living buildings, so it is imperative that designers and operators take into account the reactivity and interaction of these systems in response to natural disasters, human interference and other catastrophic events. Topics in this track include considering your design layout and accessibility, backup systems, supports and bracing, and more.

Track 5: Residential - Modern Buildings in Hot and Humid Climates

Track Chair: Dimitris Charalambopoulos

Email: dimitris@ashrae.gr

Residential dwellings require designers to consider a different scope of building functions, occupant use, and comfort. With increasing utility rates and a movement toward net zero housing, the traditional residential design models are continuously diversifying and evolving. This track will discuss how we can integrate modern residential design and building practices into hot and/or humid climates with specific challenges ranging from indoor comfort to ventilation and mold.

Track 6: Professional Skills

Track Chair: Kevin Marple

Email: kmarple@benzco.com

This track is designed to provide professionals an opportunity to develop in the areas of presentation skills, leadership, teambuilding, understanding various business operations, interpersonal skills, etc. In short, the Professional Skills Track can cover all aspects of business outside of engineering/technical applications and lends itself to interactive session types such as workshops and forums.

Track 7: Research Summit

Track Chair: Melanie Derby

Email: derbym@ksu.edu

Active research, and the exchange of those research findings are critical to the development of our HVAC&R industry and environment. The sixth annual research summit invites researchers to share those results; and this year we announce an exciting collaboration with ASHRAE's archival research publication, *Science and Technology for the Built Environment* (STBE). Researchers are invited to present papers, seminars, forums or participate in panel discussions. Authors may also pursue an opportunity to further develop their submissions for later publication in STBE

Track 8: HVAC&R Control Freaks

Track Chair: Gary C. Debes

Email: gcdebes@verizon.net

This track will focus on all things controls (note: please see track 9 "MiniTrack" as well). We invite you to join this exchange addressing one of the most dynamic areas in HVAC&R. Topics may range from design innovations spreading through our industry to the latest in building integration and observation, or even troubleshooting the most common issues occurring in building management systems.

Track 9: HVAC&R Analytics

Track Chair: Vikrant Aute

Email: vikrant@umd.edu

This track will focus on the application of analytics algorithms/tools to automate systems. The tools and data are readily available, but the challenge is in using them in a timely and effective manner to add value to our HVAC&R Systems. By discussing the basics of analytics, methods, case studies and lessons learned we can consider if machine learning is ready to replace conventional controls.

8. Future Program Ideas:

- a. Cyber security consultants –What they do? - TC 1.5 sponsor 7.5 co-sponsor suggested track 4. 3 consultants are slated. (Carol L.)
- b. Bitcoin for HVAC – What is your HVAC system doing after hours? Blockchain to improve service and security in HVAC (Tim Dwyer, Todd K)
- c. Urban scale energy modeling part 8 (Josh N.)
- d. Creating 3D models with drones (Bruce, Todd K)
- e. Home assistants HVAC shootout – We hear three home assistants state their case (Dave, Carol, Bruce)
- f. Jeopardy game on cyber security. (Carol L)
- g. BACnet tagging (Carol L.)

9. Old Program Ideas:

- a. Demo: Fly a drone during seminar: Title: Stick up your duct
- b. Seminar talking about Amazon Echo / Google Home for home automation
- c. Any BIM?
- d. SENSE - digital signatures of appliances or non-intrusive load monitoring – Contact Shetick Patel at PNNL
- e. Track idea: Sci-fi buildings: Buildings of the future

- f. Commissioning tools - Mike Galler
- g. Unconventional solutions to thermal comfort: ie - a "chill pill" to cool people psychologically
- h. Any BIM ideas?
- i. Any mobile apps ideas?
- j. "Emerging computer technologies for HVAC: New and innovative user interface for HVAC ". Get someone from a company like NEST or EcoFactor
- k. "Optimize HVAC Energy consumption through data mining approach" (Ziang/Ron):
- l. "Capturing Design Intent in BIM"
- m. "Interoperability Software and Schema Technologies for Purposes of Building Energy Modeling"
- n. "Using gbXML To Run Loads And Build Your HVAC System BIM Schematics "
- o. "Emerging Computer Technologies for HVAC"
- p. More mobile app seminars????
- q. Reality capture (geometry capture) ->
- r. Jeff Haberl -> Take GIS images
- s. "Put building geometry capture in your pipe and smoke it" MagicPlan/ Phil Haves/ John K. (3D Printing) -> Todd will work on it
- t. Jeff Haberl: Follow up to 1468 -> Dave Branson
- u. Commissioning tools: HVACCx / UT (Mike Galler)
- v. Art Halstrom->DBOSS

APPENDIX C. Meeting Agenda

ASHRAE 2018 Winter Meeting – Chicago, IL
TC 1.5 Computer Applications Research Subcommittee

Sunday, January 21, 2018 , 6:00-7:00pm, Floor 3 Madison

Chair: Todd Gottshall tgottshall@westernallied.com 925-381-3049

1. **Call to Order:**
2. **Welcome – Introductions:**
3. **Review of Agenda**
4. **New Business/Followup:**
 - a. **Work Statement Status**
 - i. **Proposed WS:1801 BIM-Data-Content-Development**
 1. Rob Hitchcock
 2. Accepted! RFP 3/15/2018
 3. Confirm PES
 - Todd Gottshall, TC 1.5
 - Dennis Knight, MTG-BIM
 - Krishnan Gowri, MTG-BIM
 - Michel Tardif, TC 7.1
 - Russell Taylor TC 7.1
 - ii. **WS-1810: gbXML Reference BIM Test Cases**
 1. Stephen Roth
 2. New Revision on Basecamp
 - iii. **WS-1811: Occupancy from Social Media Data Mining**
 1. Bing Dong
 2. Comments from RAC
 3. No Update from Las Vegas
 - b. **New RTAR Submission Deadlines**
 - i. May 15, 2017
5. **NEW RTAR Ideas**
6. **RAC Report**
 - a. **Shinsuke Kato** (kato@iis.u-tokyo.ac.jp)
7. **Next Meeting Time**
 - a. June 24, 2018 – Houston, TX
8. **Adjourn**

APPENDIX D. TC 1.5 Computer Applications Handbook Subcommittee Meeting Minutes

Jan 22, 2018

Salon 10, Palmer Hilton Hotel, Chicago, IL

1. Meeting Called to Order at 6:00 p.m.
2. In attendance – Krishnan Gowri, Subcommittee Chair; Bruce Billedeaux, Dave Branson, Tom Pollard, Lindsay King, Siddharth Premkumar, Joon-Ho Choi
3. Chapter publication deadline is June 2018, for 2019 Applications Handbook; currently we should have a review draft, but no substantial work has been done.
4. ASHRAE on-line authoring tool is available at - <http://authoring.ashrae.org>
5. All TC members can access the document using their ASHRAE credentials.
6. Bi-weekly web meeting of the interested participants is planned – the first one is scheduled for February 2, 2018 (11:00 a.m. Pacific).
7. Internal deadline for draft chapter outline and initial content is May 11, 2018, for TC review and final vote at the Houston Summer 2018 meeting.
8. Meeting Adjourned at 6:30 p.m.

Past meeting notes of items

1. Social media technologies
2. Provide history of equipment and computers – should serve as historical references
3. Simple terminologies for CPU, mouse, etc may be removed
4. What would you look for in the computer applications chapter?
 - Hardware, software and trends that help the built environment
 - Purge the parts of the chapter that no longer applies (equipment that no longer applies, possibly old volumes can be used for historical reference material)
 - Significant key areas will be perceived as having high quality pertinent information needed as reference material for practitioners
 - Include demonstration, live content of how a technology is applied
 - Definition of schema, usecases, big data,..tied to building services
 - Topics related machine learning, fuzzy logic, data mining, and
 - Include information on how to create visual media or reports

Include reference to you tube channel hosted by ASHRAE for specific topics.

Action Items from Las Vegas/Long Beach Meetings:

1. It was recommended that the TC rewrite the chapter rather than revise/edit as done in the past
2. Topics to be covered include:
 - Cloud computing, mobile technologies, big data, machine learning, modeling and simulation, HVAC applications, Systems design, component design

3. Champions for the various topics were identified as below:
 - a. Cyber security – Mike Galler
 - b. Big data – Dave Branson
 - c. Cloud computing – Joshua New
 - d. Mobile applications – Lindsey King
 - e. EMCS applications – Todd Gotschal
 - f. BIM and interoperability – Rob Hitchcock

4. A Basecamp area for handbook chapter will be created and discussions will be posted there for the entire committee to participate in the chapter rewriting process

Appendix E. Meeting Minutes

ASHRAE 2018 Winter Meeting – Chicago, IL

TC 1.5 Computer Applications Cybersecurity Subcommittee

Sunday, January 21, 4:00-5:00p, Madison (3)

Chair: Mike Galler, mikeg@nist.gov

Substitute Chair: Dave Branson, djbranson@csg.net

6. Call to Order – 4:00 pm

6. Welcome & Introductions

Mike Galler was caught up in the US Federal Government Shutdown and was unable to travel to Chicago for these ASHRAE meetings. Dave Branson is chairing the subcommittee in his absence.

Attendees:

Dave Branson

Todd Gotshall

Bruce Billedeaux

Joe Bush

Bing Dong

Mitchell Paulus

Dominique Taudin

Ryan Soo

Hans Chr Orye

Carol Lomonaco

Kevin Dunshee

Jie Li

Mark Adams

Jason Degraw

Tim Dwyer

Joshua New

6. Chair's Report

No items to report

6. Discussion

A. CIBSE Liaison Report

Tim Dwyer reported that CIBSE has not made progress with this subject and is not fully organized, and suggested that once the ASHRAE Cybersecurity GPC has been formed, an article announcing the initiative should be provided to CIBSE to help to harmonize efforts between the Societies

B. Status of Cybersecurity GPC Formation

Dave has completed the forms for submittal to ASHRAE but has not submitted them yet
Action Item – Dave Branson to submit documentation to ASHRAE to establish this GPC

C. Suggested focus of Cybersecurity GPC

- Reference guidelines already developed by other committee efforts within ASHRAE and societies related to ASHRAE (harmonize)
- Develop guidelines where none exist for areas of interest within ASHRAE
- Specifying Building Automation Systems (GPC 13)
- Building Engineering design efforts
- TG 2 HVAC Security (GPC 29)
- Integration of multiple systems

- Fire Safety
- Remote access
- Open-source code
- Protection of intellectual property during design development
- Risk management
- IoT
- Cloud-based technologies
- Maintaining cybersecurity systems (M&O)
- Identify areas that ASHRAE considers to be within Society interest and those that are not

D. Potential Liaison with Other Efforts

TG 2 HVAC Security – Carol Lomonaco to inquire about interest

TC 7.5 – Carol Lomonaco to inquire about interest

TC 1.4 via GPC 13 Controls – Todd Gottshall has indicated interest

SSPC 135 BACnet – ??? to inquire about interest

BIM MTG – Hywel Davies to inquire about interest

CIBSE – Tim Dwyer to inquire about interest

E. Development toward Guideline Content

Action Item: Mike Galler and Carol Lomonaco - write narrative about pertinent points of NIST SP 800-53 Rev. 4

F. Other

Programs this meeting: TG 2 will host Seminar 52 on Wednesday entitled, “Are you ready for the next disaster?”

5. Next Meeting Time - June 24, 2018 4:00-5:00 pm – Houston, TX

6. Adjourn – 4:50 pm