1791 Tullie Circle, N.E./Atlanta, GA 30329
404-636-8400

DRAFT

TC/TG/MTG/TRG MINUTES COVER SHEET

(Minutes of all Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/MTG/TRG No. TC-1.4 DATE 6/25/2019

TC/TG/MTG/TRG TITLE Control Theory and Application

DATE OF MEETING June 25, 2019 LOCATION Kansas City, MO

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Marcelo Acosta	2017	Israa Ajam	2017	Corresponding – 35
James Del Monaco	2017	Joe Kilcoyne	2017	Provisional – 21
Chariti Young	2017	Mark Hydeman	2017	Guests – 12
Jin Wen	2017			
Brandon Gill	2018			
Larry Fisher	2018			
Ron Bernstein	2015			

DISTRIBUTION: ***All Members of TC/TG/MTG/TRG plus the following:***	
TAC Section Head: Jennifer Leach	SH1@ashrae.net
All Committee Liaisons As Shown On TC/TG/MTG/ TRG Rosters (Research, Standards, ALI, etc.)	bholocom@easinc.net; jatkisson@aeieng.com; kato@iis,u-tokyo.ac.jp; kelly.cramm@hendersonengineers.com; rheiden@trane.com;
Steve Hammerling, Manager Of Research & Technical Services	MORTS@ashrae.net

Note: These draft minutes have not been approved and not the official, approved record until approved by the TC.

ASHRAE Technical Committee 1.4

Meeting Agenda

TC 1.4 Control Theory and Application
http://tc14.ashraetcs.org/
Tuesday, June 25, 2019 1:00 – 3:30 pm A302, Kansas City Convention Center, MO

"Commitment to the ASHRAE Code of Ethics – In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, integrity and respect for others, and we shall avoid all real or perceived conflicts of interests. (See full Code of Ethics: https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics.)"

TC 1.4 Control Theory and Application	Tuesday 1:00 PM	2104A	KCCC
TC 1.4 YEA/Education	Sunday 2:00 PM	Lobby, Taft	Marriott-East
TC 1.4 Control Components and Applications	Sunday 3:00 PM	Lobby, Taft	Marriott-East
TC 1.4 Programs	Sunday 4:00 PM	Lobby, Taft	Marriott-East
TC 1.4 Research	Monday 2:00 PM	Trianon E	Marriott-East
TC 1.4 Handbook	Monday 4:00 PM	Trianon E	Marriott-East
TC 1.4 Executive	Tuesday 9:00 AM	2213	KCCC
TC 1.4 RP-1711 SOO's for Hydronic Systems	Tuesday 10:00 AM	2213	KCCC

Seminar 4	Using Analytics and Big Data to Optimize Your HVAC Systems	Sunday 8:00AM	2103C	KCCC
Seminar 18	The Technical Engineers Pathway to Career Growth: A Geek's Guide to Success	Sunday 1:30PM	2105	KCCC
Seminar 23	Secrets of (Controls Implementation) Success	Monday 8:00AM	2105	KCCC
Seminar 54	Optimal Chilled Water Plant Design and Operation: What a "Smart Valve" Can Do for You	Tuesday 11:00	2104B	KCCC
Seminar 66	YEA Controls FUNdamentals: What to Know about Careers in Controls and the Basics of BAS	Wed 9:45	2104A	KCCC

1) Call to Order

2) Introduce Members, Guests, and Liaisons

3) Roll Call (Quorum)

X	Marcelo Acosta, 6/30/19		Mark Hydeman, 6/30/21
X	James Del Monaco, 6/30/21	X	Chariti Yung, 6/30/21
	Joe Kilcoyne, 6/30/19	X	Ron Bernstein, 6/30/19
X	Larry Fisher, 6/30/22		Israa Ajam, 6/30/21
X	Brandon Gill, 6/30/22	X	Jin Wen, 6/30/21

4) TC 1.4 Scope

a) ASHRAE Technical Committee 1.4 is concerned with control theory, systems, and components (excluding refrigerant flow controls) for heating, ventilating, air conditioning, and refrigeration uses.

5) Approve minutes from previous meeting (posted on website)

a) Ron motions to approve. Jin seconds. Approved 7-0-0

6) Approve agenda

a) Ron motions to approve. James seconds. Approved 7-0-0

7) Group Discussion point

a) **Are ASHRAE's Vision, Mission, and Strategy right?**
   i) Short presentation by Marcelo to introduce the concepts and questions, followed by discussion by everyone in the room
   ii) Please send to TC0104@ashrae.net your thoughts and proposals for an ASHRAE Vision that will make adopting more sustainable HVAC&R practices more palatable for everyone in the building industry, including owners and occupants.

8) TC Membership activity and productivity analysis
   i) Methodology, results and conclusions presented by Marcelo
   ii) Effective size and effective productivity, for the TWGs restructure proposed by TAC
      (1) Averaged over the last 2 years, the effective size of the TC is 20 medium involved people, and the productivity the result of approximately 640 working hours/year. It's noted this is the equivalent of 1 part time person or 0.27% of the members working hours.
   iii) However, the engagement and productivity of new members is rapidly increasing. Over those last 2 years, the number of contributing members has increased from 22 to 35, and the hours contributed from 276 to 460.

9) New business
   i) Paul Ehrlich (from B.I.G.) presentation of a new controls programming language called Controls Description Language (CDL).
   ii) The language is block-diagram based and meant for consultants to convey unambiguous sequences of operation.
   iii) The US Department Of Energy (DOE) is already financing an initiative called Open Building Controls Project (http://obc.lbl.gov/) for the development of this language
   iv) Looking for volunteers to work with our Standards subcommittee chair, Steve Taylor, and Michael Wetter (Lawrence Berkeley Lab), putting together a proposal to create a new ASHRAE Standard Project Committee to regulate and continuously improve the Controls

Description Language presented at our Main Meeting.

v) TC-1.5 Proposal for a new MTG to work on Cybersecurity and ask or TC-1.4 to support that effort.
vi) Chariti motions to support the initiative. Ron seconds. **Approved 7-0-0**

10) Announcements

a) **TAC – Technical Activities Committee**
i) Report on TAC initiative to reduce the number of technical groups

E.c.7. 2019-06_TC Reorg Update_SEM.

(1) In a nutshell: Only some technical groups will be directly reorganized by TAC, with changes taking effect at the 2020 Annual Conference (Austin, TX). However, all groups are encouraged to consider using more online meetings, integrate subcommittee meetings, and share their best practices.
(2) First change introduced: Joint Chairs/Vice-Chair meeting for all Sections.
ii) New Manager of Research and Technical Services (MORTS): Steve Hammerling morts@ashrae.net
iii) New Section 1 Head: Jeniffer Leach SH1@ashrae.net

b) **CEC – Conferences and Expositions Committee**
i) Larry's 3-hour course about "Best Practices for Installing DDC Control Systems" was approved. But the name wasn't. Looking for catchier / sexier name suggestions. First delivery will be in Orlando.
ii) New Chair: Michael Collarin Michael.Collarin@parsons.com
iii) Technical Program Statistics for Kansas City:
Conference Papers and Extended Abstracts
- 96 conference paper abstracts submitted, 83 approved
- 39 conference papers presented
- 72 extended abstracts submitted, 42 approved NEW!
- 22 Conference Paper Sessions

Technical Papers
- 20 Technical papers received
- 11 Technical papers presented
- 4 Technical Paper Sessions

Seminars
- 110 submitted
- 73 presented

Panels
- 5 submitted
- 3 scheduled

Workshops
- 8 submitted
- 4 scheduled

Forums
- 3 submitted
- 0 scheduled

Debates
- 3 submitted
- 2 scheduled

iv) Upcoming conferences
- 2020 Winter – Orlando, FL, February 1 – 5, 2020
- 2020 Annual – Austin, TX June 27 – July 1, 2020
- 2021 Winter – Chicago, Illinois, January 23 – 27
- 2021 Annual – Phoenix, Arizona, June 26 – 30
- 2022 Winter – Las Vegas, Nevada, Jan. 29 – Feb. 2

c) **RAC – Research Activities Committee**
i) At the time these minutes were sent out, RAC hadn't issued a report for this conference.
ii) We expect them to approve our WS-1868 - DOAS Optimization.

d) **Member Awards**
i) The committee **approved 8-0-0** to award the following honorary titles to 4 of its members
(1) Barry Bridges – The Character of TC-1.4
(2) Frank Shadpour – The Guru of TC-1.4
(3) Steve Taylor – The Strength of TC-1.4
(4) Charity Yung – The Heart of TC-1.4
ii) The reasoning behind this has been posted on our Basecamp site https://3.basecamp.com/3106353/projects/8184907 under the Member Awards folder.

11) OLD BUSINESS

a) PROJECT COMMITTEE AND ONGOING RESEARCH REPORTS

i) SSPC 135 (BACnet) – Michael Osborne / Carol Lomonaco
(1) Working on Semantic Tagging (Standard 223P), Secure Connect, and ISO 16484-5 and -6 updates.
(2) Will obsolete the current Security scheme due to very low adoption.
(3) Researching Semantic Tagging
(4) Looking for volunteers
(a) To help with Integrator's and Developer's Guides
(b) Also, security people who understand Bootstrapping.

ii) SGPC 13 (Specifying Building Automation Systems) – Phil Naughton
(1) 5 addenda out for review
(2) Considering new sections on Cybersecurity considerations, and integration of IoT devices

iii) SGPC 36 (High Performance Sequences of Operation for HVAC Systems) – Mark Hydeman / Steve Taylor
(1) Steve Taylor replaces Mark as Chair of SGPC-36 on July 1st
(2) 5 addenda out for review

iv) RP-1711 (High Performance SOOs – Hydronic Systems) – Marcelo Acosta
(1) Working on tasks 3 and 4. Found the implementation more complex than expected.
(2) The PI requests a 6 month no cost extension. Ron motions to approve the extension. Larry seconds. **Approved 4-0-3** (Note: the 3 abstentions are due to conflicts of interest)
(3) The new expected completion date is December 2019.

b) SUB-COMMITTEE REPORTS
i) **Executive** – Marcelo Acosta

(1) TC-1.4 Leadership Updates starting July 1, 2019:
  (a) New Chair: James Del Monaco
  (b) New Vice-Chair: Joseph Kilcoyne
  (c) New Secretary/Webmaster: Elise Backstrom
  (d) Amanda Pertzborn, Nemat Lofti, and Christopher Benson replace the 3 voting members who roll out in July
  (Israa Ajam, Ron Bernstein, Marcelo Acosta)
  (e) New Handbook Chair replacing James Del Monaco: Charlotte Dean
  (f) New Vice-chair for Handbook: Taraneh Shoorideh
  (g) New Vice-chair for YEA: Elise Backstrom
  (h) New Vice-chair for Program: Christopher Benson
  (i) New Vice-chair for Research: Amanda Pertzborn
  (j) New Vice-chair for Control Components and Applications: Ryan Williams
(2) Roster Membership Update
  (a) 34 Corresponding Members deleted
  (b) 9 PCMs promoted to CMs
(3) Macroblocks initiative/vision requires activities can be coordinated across TCs, and completion of Guideline 36 with hydronics (ETA: July 2020). However, the new controls language standard proposed by Paul Ehrlich is a needed component, so we are moving in that direction.

ii) **Education/YEA** – Michelle Shadpour
(1) Intro to the TC was presented, as well as video and Instagram initiatives.

iii) **Control Components and Applications** – Chad Moore
(1) New ideas for the TC to work on - research and seminars
(2) Discussion centered around the impact of new technologies in building controls: 5G, IoT, Cybersecurity, embedded sensors, occupants' cellphones data capture.

iv) **Program** – Frank Shadpour
(1) 5 sessions at this conference (sponsored and co-sponsored)
(2) 11 proposals for Orlando

v) **Research** – Kim Barker
(1) 1711-RP (Advanced Sequences of Operation for HVAC Systems – Phase II Central Plants and Hydronic Systems) – Marcelo Acosta
  (a) Task 2 – Final submission approved
  (b) Task 3 – First submission. Not voted yet
  (c) Task 4 – Started
  (d) 6 months no-cost extension requested
(2) 1 WS approved and submitted
  (a) WS-1865 DOAs Supply Temperature Optimization.
(3) 4 other RTARs & WSs under development

vi) **Handbook** – James Del Monaco
(1) Chapter 47 of Applications just published
(2) Chapter 7 of Fundamentals – Review ongoing
(3) Control Valves chapter was open for co-review. TC-6.1 approved it this conference.
(4) Handbook central:
https://www.ashrae.org/technical-resources/ashrae-handbook/ashrae-handbook-central

vii) **Standards** – Steve Taylor
(1) The subcommittee will prepare a submittal for Standards to review: CDL language new standard

viii) **Webmaster** – Joseph Kilcoyne
(1) Website is up-to-date.

c) COMMITTEE LIASION REPORTS
i) TC 1.5 (Computer Applications) – Mike Pouchak.
ii) TG 2 HVAC Security – Kim Barker
iii) TC 5.6 (Control of Fire & Smoke)
iv) TC 6.1 (Hydronic Systems)
v) TC 6.7 (Solar Energy Utilization) – Gaylen Atkinson
vi) TC 7.3 (Operations & Maintenance Management)
vii) TC 7.5 (Smart Building Systems) – Jin Wen
viii) TC 7.6 (Systems Energy Utilization)
ix) TC 7.9 (Building Commissioning) – David Bornside
x) TC 9.10 (Laboratory Systems) – Jim Coogan
xi) TC 9.11 (Clean Rooms) – Phil Naughton
xii) SSPC 62.1 (Ventilation and Acceptable IAQ) − Len Damiano
xiii) SSPC 90.1 (Energy Efficient Design of New Buildings) – Steve Taylor
xiv) SSPC 202 (Commissioning Process for Buildings and Systems) – Barry Bridges
(1) Many changes to Standard 202 to be voted on are for clarification like the "Commissioning Process" is to be presented as "Cx"; or the owner identified entity, responsible for delivery is the Cx Provider, "CxP".
(2) More substantial changes for example include the description of the owners' project requirements, OPR. The critical details for the commissioning process for a given project.
(3) Also in progress in 202 is the Review of Annexes to approve for publication. The intent is to have these common annexes used by all SSPC 300 family documents. These annexes agreed to in 202 need approval by SSPC 300. The annex documents are those generated through the related Cx committees: TC 7.9; SSPC 300; Std 202; GL 0, 0.1, 0.2, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6
xv) TC 1.6 (Terminology) – Phill Naughton
xvi) SGPC 0.2 & 1.2 (The Commissioning Process) – David Bornside
xvii) SPC134 (Graphic symbols for HVAC systems) – David Bornside
xviii) SPC 189.1 Design of High Performance Building – Bogi Setty
xix) MTG Occupant Behavior in Buildings – Kim Barker

d) SOCIETY COMMITTEES

12) Upcoming Deadlines

- Orlando Winter Conference - February 1 – 5, 2020
- Seminar and Forum proposals for Orlando are due by Friday, August 2, 2019
- RTARs & Work Statements Thursday August 15, 2019
- Conference Website: https://www.ashrae.org/conferences/2020-winter-conference-orlando
- Conference Chair: Melanie Derby
- Program Focus at Orlando Winter Conference
  i. Track 1: HVAC&R Fundamentals and Applications
  ii. Track 2: Systems and Equipment
  iii. Track 3: Refrigeration and Refrigerants

iv. Track 4: Cutting Edge Approaches
v. Track 5: High Efficiency Design and Operation
vi. Track 6: Big Data and Smart Controls
vii. Track 7: Ventilation, IAQ and Air Distribution Systems
viii. Track 8: Standards, Guidelines and Codes

13) Next Meeting – Orlando, FL | February 1 – 5, 2020

14) Adjourn

TC 1.4 – YEA Education Subcommittee
ASHRAE Summer Meeting
Atlanta – June 2019

The subject meeting was held on Sunday, June 23, 2018 starting at 2:00 PM. The attendees included YEA members, non-corresponding members, corresponding members, and voting members. The sign-in sheet is attached. Special thanks to the active members of TC 1.4.

Meeting Minutes: **June 22 – June 26, 2019**

1) Introductions
2) Young Engineers in ASHRAE (YEA) attendance
3) Discussion Topics
    a) What is a TC?
    b) What does TC 1.4 do?
        i) Subcommittees – education, programs, research, handbook, etc.
    c) How did the YEA members in attendance hear about our committee meeting?
    d) How to increase involvement of YEA members?
    e) Active
        i) Instagram member spotlight (follow us @millennialengineers)
        ii) Facebook
        iii) Seminar Series (FUNdamentals)
        iv) Email Blasts (2x a year)
        v) Outreach Kit / Presentation
        vi) TC 1. 4 YEA lunch or dinner social event

TC1.4 Control Components & Applications Subcommittee Meeting

Meeting Date: June 24, 2019, 3:00 -4:00 pm

Marriot – East Lobby – Taft

Subcommittee Focus: Brainstorming Session, "open forum" discussing what is new in Building Automation System control components and applications.

Minutes:

1. **Introductions**
2. **Discussion Topics**

- Mentoring for controls. Discussed Seminar 18: The Technical Engineers Pathway to Career Growth: A Geek's Guide to Success. Speakers discussed the topics presented in Seminar 18.
- Building codes and standards regulate required temperature, humidity and air flows in healthcare operations. These parameters and their limits are defined in various standards including ASHRAE Standard 170. Our discussion centered around can Building Automation System (BAS) data be used to satisfy Joint Commission documentation of these parameters. Our discussion ended with an action item for Chad Moore to further research exiting codes that may prohibit the use of BAS data for Joint Commission documentation and give a report back to this committee in Orlando and the 2020 winter meeting.
- Is there an ASHRAE Standard committee that develops standards to test and calibrate thermostats? Not to the attendees knowledge.
- With the advancement of data communication technology (specifically 5G cellular data communication) how does this impact the BAS/controls technology? We discussed how this technology may impact our industry but it is still too new to have concrete knowledge as to exact impacts. Attendees agreed that it will be good for TC 1.4 to get involved in this technology as it relates to building automation. Integration and control logic challenges still exist. The bigger question is how do we overcome the integration and logic challenges and leverage 5G communication? This will be a topic for future CCA discussion.
- What other TC's or MTG's are working on cyber security within ASHRAE?
- How are "Smart Buildings" going to interact with the "Smart Power Grid"?
- Control Description Language (CDL) – generic language for writing control sequences.
- Who owns sequence of operations developed by ASHRAE?
- How to control HVAC systems without refrigerants? K18, K6 Roash pharmaceutical company developing non-HFC, HCFC, etc. refrigerants.
- What is ASHRAE doing to educate/train control technicians/manufacturer's to implement advanced sequences of operations?

3. **Future CCA Discussion Topics**

- Updates to Standard 62.1 minimum VAV zone flow modifications
- GUI's and dashboards – need understanding of the problem to answer, of the data available, and capability to present the data in an effective manner; hard to find a party that can do all three – it's an issue
- What makes for maintainable programming code; organization, comments, meeting design intent?

- Neural networks and machine learning; how can controls components be optimized by these new neural networks that can analyze thousands of points? Google has proven out 40% savings in the CHW systems serving their data centers using "narrow AI" applied to their equipment
- Fault Detection and Diagnostics to keep the built environment efficient; cosponsor a program with 7.9?
- How do you make the unseen seen in building automation systems?
- Occupant centered controls – it changes the paradigm from room sensors; people counters for outside air control; looks at shoulder diameter to find if you are wearing a lot of clothes or are a big/heavy person; thermal comfort is currently rated lowest in all categories of building environment
- New sources of data for integration – medical devices, wearables, etc.
- Allow user requests into the BAS; specifically, into new Guideline 36 sequences
- There was an ASHRAE study which indicated that people with operable windows don't do well with maintaining temperature, but makes themselves much more satisfied with thermal comfort
- ASHRAE classes and certifications on controls
- How to bridge the gap of under control vs. over control (in terms of point qty)
- Lack of integration in systems; the difference between open protocol and "plug and play"
- Sequencing of HVAC systems based on energy performance of the space and occupant satisfaction; how can they be integrated together for total energy integration
- How to convert from design to installation? Differences in styles in specifiers as well as installers as well as the maintenance staff
- Airflow technologies – pitot tubes vs. thermal dispersion for VAV box airflow sensing, specifically for net zero buildings.
- Cybersecurity updates to Guideline 13 by Ron Bernstein
- API for Guideline 13 by Ron Bernstein;
- Common graphics for Guideline 13 by Ron Bernstein;
- Common data point profiles for equipment and new sensors/actuators for Guideline 13 by Ask Ron Bernstein;
- Occupant behavior; can devices learn to adapt to the occupant needs through AI?

4. **Adjourned meeting at 4:05 p.m.**

TC 1.4 – PROGRAM SUBCOMMITTEE
ASHRAE SUMMER MEETING
ATLANTA – JUNE 2019

The subject meeting was held on Sunday, June 23, 2018 starting at 4:00 PM following the Components and Control Applications Subcommittee meeting. The attendees remained. The sign-in sheet is attached. Special thanks to the active members of TC 1.4.

Programs Presented in Kansas City: **June 22 – June 26, 2019**

1. **Seminar 4: Using Analytics and Big Data to Optimize Your HVAC Systems**
   Chair: David Lee,
   Track: Optimization in HVAC&R, Room: 2103C, KCCC
   Sunday, 8:00 AM – 9:00 AM, Room: Building A, A305

2. **Seminar 18: The Technical Engineers Pathway to Career Growth: A Geek's Guide to Success**
   Track: Professional Development
   Chair: David Kahn
   Track: Professional Development
   Sunday, 1:30 PM – 3:00 PM Room: 2105, KCCC

3. **Seminar 23: Secrets of (Controls Implementation) Success**
   Track: Commissioning New & Existing Buildings
   Chair: Chariti Young
   Monday, 8:00 AM – 9:30 AM Room: 2105, KCCC

4. **Seminar 54: Optimal CHW Plant Design and Operation**
   Track: Commissioning New & Existing Buildings
   Chair: Scott Hackel,
   Tuesday,11:00 AM – 12:30 PM Room: 2104B, KCCC

5. **Seminar 66: YEA Controls FUNdamentals: What to Know about Careers in Controls and the Basics of BAS**
   Track: Professional Development
   Chair: Elise Backstrom,
   Wednesday, 9:45 AM – 10:45 AM, Room: 2104A, KCCC

Anticipated Programs for 2019 Kansas City That Did Not Take Place:

1. **Debate: Control Component Nano-Blocks vs. Macro- Blocks. Is Bigger Better?**
   Chair: Marcelo Acosta

2. **Seminar: Architecting Building Automation Systems – The convergence of IT, OT & IoT.**
   Chair: Ron Bernstein (Guideline 36, Guideline 13)

3. **Seminar: Control of District Energy and Cogen Systems**
   Chair: Chad Moore (TC 6.2)

4. **Seminar: Smart is as Smart does – Data integrated buildings!**
   Chair: Clay Nesler

5. **Seminar: Minimizing Energy Use with Primary DOAS and Secondary Fan Powered Units in the Occupied Space!**
   Chair: Jim Coogan

6. **Seminar: Too Many Alarms! What's the problem?**
   Chair: Carol Lomonaco

Programs Proposed for 2020 Orlando Winter Meeting **Feb 01 - Feb 05, 2020**

1. **Debate: Control Subsystem LEGO®s vs. Custom Solution Sculptures? Which approach yields better results?**
   Chair: Marcelo Acosta

2. **Seminar: Controls in an Evolving Landscape - The Impact of 5G, Blockchain, AI and Other Exciting Technologies**
   Chair: Ron Bernstein (Guideline 13)
   Cosponsor TC 1.5 (Amanda Pertzborn)

3. **Seminar: Control of District Energy and Cogen Systems**
   Chair: Chad Moore (TC 6.2)

4. **Seminar: Smart is as Smart does: Case Studies from Intelligent Florida Buildings, Campuses, and Cities**
   Chair: Chariti Young
   Cosponsor TC 1.5, 7.5

5. **Seminar: Minimizing Energy Use with Primary DOAS and Secondary Fan Powered Units in the Occupied Space**
   Chair: Jim Coogan

6. **Seminar: Show me the money! Cost-based Control of Supply Air Temperature**
   Chair: Taraneh Shoorideh

7. **Seminar: YEA – Cutting-Edge Building Sutomation Concepts**
   Chair: Elise Backstrom

8. **Seminar: Automating Control Sequence Selection and Evaluation**
   Chair: Philip Haves

9. **Seminar: What have you done for me lately? BAS Best Practices for O&M Success**
   Chair: Greg Cmar
   Cosponsor TC7.3

10. **Seminar: What is BACnet SC? How to secure your BACnet network**
    Chair: Carol Lomonaco (must be Tuesday 2/4/2020 before noon)
    Co-Sponsor with 7.5 and 1.5 and SSPC 135

11. **Seminar: Building Automation for the Hospital of the Future**
    Chair: Jim Coogan
    Cosponsor TC9.6

Program "Pipeline" for Future Meetings:

1. Should I be Alarmed? Part I: BACnet Alarm Options and When to Use them
   Chair: Carol Lomonaco

2. Should I be Alarmed? Part 2: Building Operations Alarming Best Practices
   Chair: Michelle Shadpour
   TC7.3 Co-sponsor

3. Should I be Alarmed? Part 3: Improving BAS Alarm Specification
   Chair: Chariti Young

4. Seminar: How to Become a Building Automation Engineer?
   Chair: Dave Kahn (YEA)

5. "Be Alarmed at what your BAS is not Telling You: Is no news really good news?"

6. Web-Services. XML, SOAP: How Do I Get Non-Traditional BAS Information and Use It for My Building Automation.

7. Controls for Fuel cells, Cogeneration and Micro-cogeneration, Renewables

8. Data Analytics… What interesting information can be derived from BAS data?

9. Special Sensors: Contaminants and Microbial Sensors

10. Project Control Submittals – What should it include?

11. Designing Command and Control Center for Buildings and large campuses

12. Humidifiers and Humidity Control for Critical Spaces.

13. How to Assess the DDC systems of an Existing Facility?

14. What Is That Most Consulting Engineers Are Doing Poorly? How to Properly design and specify control systems?

15. Seminar: IAQ & Comfort through Building Automation Systems

16. Application of narrow AI in BAS, in the near future – Machine learning!

17. Seminar or Conference Paper by Ron Bernstein: Smart Grid and Smart Buildings

Deadlines for 2020 Orlando Winter Meeting, Feb 01 - Feb 05, 2020:

March 18, 2019: Conference Paper Abstracts, Technical Papers and Paper Session Requests

April 22, 2019: Conference Paper Abstract Accept/Reject Notifications

June 7, 2019: Website Opens for Seminar, Workshop, Forum, Debate, and Panel Proposals

July 8, 2019: Final Conference Papers Due - Submitted for Review (Includes Bio, Learning Objectives and Methods of Assessment); Request for Conference Paper Sessions Due

July 26, 2019: Conference Paper Accept/Revise/Reject Notifications

August 2, 2019: Seminar, Workshop, Forum, Debate, and Panel Proposals Due

August 9, 2019: Revised Conference Papers/Final Technical Papers Due

August 26, 2019: Conference and Technical Paper Final Accept/Reject Notifications

October 4, 2019: Seminar, Workshop, Forum, Debate, and Panel Accept/Reject Notifications

These minutes stated herein were approved by TC1.4 program subcommittee on Sunday, January, 15, 2019.

Submitted by: Frank Shadpour, PE

TC1.4 Program Subcommittee Chair

frank@scengineers.net

TC 1.4 Control Theory and Applications

Research Subcommittee (RSC) Activities — Kansas City – Jun 23, 2019

RSC Meeting Minutes:

1. Announcements
   a) Stats
      - RTARs: 1 Accepted, 2 Accepted with comments, 3 Rejected
      - WSs: 1 Accepted, 5 Conditionally accepted, 7 Returned
   b) Honors & Awards (5)
      - Grant In Aid
      - Service to ASHRAE Research
      - Homer Adams Award
      - Innovative Research Grant (IRG) pre-proposals
      - New Investigator Award
   c) [NEW] PTAR (Publication Topic Acceptance Request) to be rolled out after Kansas City,
   d) Web-based Training Modules for RTAR, WS, PES and PMS.
   e) WS and TRP's must have milestone chart and associated costs for each milestone as a percent of total project cost. Bidders may propose a different milestone chart with associated costs than suggested in the RFP. A questionnaire will be sent to PMS Chair at each milestone level to obtain project status. Payments at each milestone level will be made to the contractor only after approval of each milestone deliverables by the PMS.
   f) Reminder:
      - RTARs and WSs should be reviewed by liaison prior to submission to RAC. TC 1.4 Research Liaison is Ahmed Kashef RL1@ashrae.net and Art Giesler RACvchair@ashrae.net

Active Project Status:

Name	Project	PMS	Status
RP-1455		**Mike Pouchak**	**PMS will provide DISPOSTION to MORTS** TC NEEDS TO PROVIDE COMPLETED DISPOSITION OF ASHRAE RESEARCH RESULTS FORM TO MORTS TO CLOSE-OUT PROJECT Research chair will send email.
RP-1587		**Steve Taylor**	**PMS will provide DISPOSTION to MORTS** TC NEEDS TO PROVIDE COMPLETED DISPOSITION OF ASHRAE RESEARCH RESULTS FORM TO MORTS TO CLOSE-OUT PROJECT
RP-1711	Advanced Sequences of Operation for HVAC Systems – Phase II Central Plants and Hydronic Systems	Barry Bridges Marcelo Acosta Mark Hegberg Justin Atkinson	**PROJECT ON SCHEDULE AND PROGRESS REPORTS UP-TO-DATE** Meeting Tuesday KCCC,2213 10:00 -11:00 am
RP-1661 **TC 4.7 w/1.4 Co-Sponsor**	Development of Modelica Models for Evaluation of Supervisory Control Strategies	Michael Wetter Wangda Zuo Jeff Stein	Done with Task1. Working on Task2 development of models. On-schedule. Next is Task3 evaluation of models

2. Pending Research Project Status:

Status	Project	Champion	Remarks
WS-1865	Optimizing Supply Air Temperature Control for Dedicated Outside Air Systems	Jingjuan (Dove) Feng Steve Taylor Brandon Gill	TC 1.4 voted to approve (email vote), WS submitted to RAC May 15, 2019

3. Possible Research Project Status:

Status	Other TCs	Project	Champion	Remarks
RTAR	Co-sponsor TC	Common GUI system graphics for BAS Operators Specifying BAS graphics (Data sets, functional objects)	Marcelo Acosta Barry Bridges John Wallace Ron Bernstein Hwakong Cheng	Identify minimal data set required for functional objects. Make graphics that are user-friendly. Number of clicks to navigate, Recommendations, how many bells and whistles get turned off to do your work. RP-1633. GUI for SGPC-36 sequences. GPC-13 can provide, examples.
WS		%kW vs, %CFM and %GPM curves for real systems	Steve Taylor Joe Zhou Jim Coogan Jin Wen	Real variable flow systems do not have ideal parabolic system curves because of closing dampers/valves. DP setpoint reset helps but actual and simulated performance doesn't match. WAIT
WS	Co-sponsor TC 6.1	Selecting Control Valves	Steve Taylor Carol Lomonaco	Work statement under development.
IDEA		Field verification of GPC36 Single Zone VAV RTU	**Kim Barker**	Need to read and investigate the merit of this IDEA. What are benefits of applying GPC36 to SzVav RTUs.
IDEA	Co-sponsor TC7.5	Effectiveness of Night Setback and Optimum Start	**Gregory Cmar** Kim Barker Joe Zhou	Cold climates impact SSTO. How can we automate when you need to adjust night setback variable. Develop control sequence based on recovery time. Simulation for guidelines for changing reset temperature. Determine seasonal space temperature setpoint reset and/or impact of using rolling weather forecast (next-day, 3-day, 7-day) via internet.

Status	Other TCs	Project	Champion	Remarks
IDEA	7.5 7.3	Alarm Management, Alarm escalation, suppression, alarm flooding, latching etc..	**Carol Lomonaco** Kim Barker Jin Wen (TC7.5)	Prioritize alarms and what do you do with it! Missing use cases. BACnet alarms. What are issue for research. *BAS Alarm Management for Operation and Maintenance Decision Making (CH-18-C001)* Validation of GPC36 alarms.
IDEA		Optimized Supply Air Temperature Reset Strategies	Steve Taylor Joe Zhou Jim Coogan Mike Pouchak	CEC project completed, do we want to do this for other climate zones. Incorporate active learning…
IDEA		Coordinating control of hybrid radiant and air systems for maximum efficiency	Phil Haves	Applies primarily to hybrid systems but also could apply to DOAS with respect to supply air temperature control.
IDEA		Develop conventional sequences from MPC optimized sequences	Phil Haves Jayson Bursill Donghum Kim	Near-optimum sequences developed from model predictive controls that are too cumbersome to work in real-time control systems.
RTAR	TC 7.9 TC 7.3	Persistence, Cost & Benefits of Commissioned Building Controls	David Underwood Joe Zhou Scott Hackel Ron Bernstein	When do building performance start to degrade? Report done by ComEd (28 bldgs).
IDEA		Control Spec builder for GPC36		SOO builder SW Tool – not research. Potential PTAR Proposal with LBNL-DOE funding, free software. Funding one-time effort needs to provide continuous maintenance to support SW Tool.
IDEA		Retrofit of Adv. RTUs for mitigation of risks.	Chris Benson	Managing of the Adv. RTU conversion/retrofit. What steps need to be added to the process to identify if risk Is any risk to building occupants and equipment life/liability.
IDEA			Chris Benson	What do the adv sequences optimize? Optimization of cost, energy, carbon may impact selection sequences used.
IDEA	7.5		Jayson Bursill	Separate sensor proxy for different type of functions. Cost benefit, function benefits, Define best measurement. Example:occupancy sensor, security. Proxy for other values. May have home in GPC-13

4. Research RTARs and WS Deadlines:
    - March 15 for spring meeting
    - May 15 for June meeting
    - **August 15 for fall meeting**
    - December 15 for January meeting
5. Adjourn: 3:33 pm

TC 1.4 Control Theory and Applications

Handbook Subcommittee

June 24, 2019 / 4:00 – 6:00

Marriott-East - Trianon E

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1. **CALL TO ORDER**
2. **REPORT FROM APPLICATIONS HANDBOOK LIAISON (Bryan Holcomb)**
   2.1. Applications Handbook was issued in June 2019.
3. **REPORT FROM FUNDAMENTALS HANDBOOK LIAISON (Jason Atkisson)**
   3.1. TC approval for 2021 Fundamentals, Chapter 7 "Fundamentals of Control" is due on July 5, 2020.
4. **NEW BUSINESS**
   4.1. The subcommittee is in the process of editing Fundamentals, Chapter 7.
   4.2. Edits to the Chapter will be done using the ASHRAE Authoring Portal (AAP). The link to the portal is as follows: www.portal.ashrae.org. Internet Explorer is the only compatible browser. Anyone who's associated with TC1.4 can access the Chapters associated with this TC. Further guidance on the AAP can be found at the following link: https://www.ashrae.org/technical-resources/ashrae-handbook/ashrae-handbook-central
   4.3. Jason Atkisson (TC6.1 Valves Liason) requested TC1.4 members review the Valves Chapter. He'll reach out when a draft is available for review.
   4.4. Joe Zhou (TC7.5) requested TC1.4 members assist in the review of Chapter 42 *Supervisory Control Strategies and Optimization* and Chapter 61 *Smart Building Systems* of the HVAC Applications handbook.
   4.5. Chapter 7 of the Fundamental Review for TC1.4 has been split up into several sections.
      4.5.1. Charlotte will do a General Review as well as focus on CxA and Tuning Sections.
      4.5.2. Terry and Chris will review the Control Devices sections.
      4.5.3. Dave will do a General Review as well as focus on the Bibliography Section.
      4.5.4. Ron and Chariti will review the Networks and Specifying Building Automation Systems sections.
5. **NEXT MEETING AND SCHEDULE**
   5.1. 4: 00-6:00 Monday February 3, 2020 Winter Meeting in Orlando, MO.
6. **Adjourn**

   Adjourn at 6:00

TC 1.4 Handbook Subcommittee Attendance List

Present	Name	
X	James Del Monaco	

X	Barry Bridges (Remote)	
X	Chariti Young	
X	Dave Kahn	
X	Chad Moore	
X	Marcelo Acosta	
X	Charlotte Dean	
X	Chris Miller	
X	Taraneh Shoorideh	
X	Terry Schroeder	
X	Riad Assaf	
X	Ron Bernstein	
X	Christopher Benson	
X	Christopher Battisti	
X	Philip Haves	
X	Joe Zhou	
X	Amanda Petzborn	
X	James Bradburn	
X	Jayson Bursill	
X	Ryan Williams	
X	Bryan Blackham	
Liaisons		
	Bryan Holcomb	Applications Handbook Liaison
X	Jason Atkisson	Liaison from TC 6.1 Valves
X	Jason Atkisson	Fundamentals Handbook Liaison

TC 1.4 Control Theory and Application

RP-1711 - High Performance SOO's for Hydronic Systems

PMS Meeting Minutes **June 25, 2019**

10:00-11:00am **KCCC, Room 2213**

RP-1711 –

Attendance

For the PI	For the PMS
Steve Taylor	Marcelo Acosta
Brandon Gill	Chad Moore
Ed Morris	
Chariti Yung	(3 absent members)

Guests: 16

1) The PI presented the progress status:
   a. Working on Task 3 (programming) and Task 4 (debugging) in parallel, as these are iterative process that feed on each other.
   b. The scope of work is higher than anticipated, due to the number of configurations (6) required to cover all sequences, and how detailed they are. The PI requests a 6 months no-cost extension.
   c. A preliminary submission, of 1 configuration was delivered to the PMS, and is being reviewed.
2) The PMS recommends accepting the requested extension.

Adjourned at 10:30