



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 1/23/2019

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

DATE OF MEETING Jan 15, 2019 LOCATION Atlanta, GA

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Marcelo Acosta	2017	Israa Ajam	2017	Corresponding – 25
James Del Monaco	2017	Mark Hydeman	2017	Provisional – 5
Joe Kilcoyne	2017	Ron Bernstein	2015	Guests – 15
Chariti Young	2017			
Jin Wen	2017			
Brandon Gill	2018			
Larry Fisher	2018			

DISTRIBUTION: All Members of TC/TG/MTG/TRG plus the following:

TAC Section Head: Amir Jokar, Ph.D., P.E., CFEI	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 ;
Mike Vaughn, 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 Minutes

TC 1.4 Control Theory and Application

<http://tc14.ashraetcs.org/>

Tuesday, January 15, 2018 1:00 – 3:30 pm A302, Georgia World Congress Center, Atlanta GA

“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	A302	GWCC, Bldg A
TC 1.4 YEA/Education	Sunday 2:00 PM	B319	GWCC, Bldg B
TC 1.4 Control Components and Applications	Sunday 3:00 PM	B319	GWCC, Bldg B
TC 1.4 Programs	Sunday 4:00 PM	B319	GWCC, Bldg B
TC 1.4 Research	Monday 2:30 PM	Hazelnut	Omni
TC 1.4 Handbook	Monday 4:30 PM	Hazelnut	Omni
TC 1.4 Executive	Tuesday 8:30 AM	Willow	Omni
TC 1.4 RP-1711 SOO’s for Hydronic Systems	Tuesday 9:30 AM	Willow	Omni

Seminar 9	The Doctor is In! Diagnosing Common System Issues and Misapplications in Building Automation Systems	Sunday Jan 13, 9:45am
Seminar 37	Space Pressurization for Infection Control and Hospital Accreditation	Monday Jan 14, 11:00am
Seminar TC	Want to CONTROL the World?	Tuesday Jan 15, 1:00pm
Workshop 7	An Overview of the Newly Published Guideline 36	Wedsdy Jan 16, 8:00am
Seminar 68	Integration of Renewable Systems and Natural Ventilation: Control Challenges	Wedsdy Jan 16, 9:45pm

1) Call to Order

2) Introduce Members, Guests, and Liaisons

3) Roll Call (Quorum)

X	Marcelo Acosta, 6/30/19
X	James Del Monaco, 6/30/21
X	Joe Kilcoyne, 6/30/19
X	Larry Fisher, 6/30/22
X	Brandon Gill, 6/30/22

	Mark Hydeman, 6/30/21
X	Chariti Yung, 6/30/21
	Ron Bernstein, 6/30/19
	Israa Ajam, 6/30/21
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) Chariti Yung motions to approve. Larry Fisher seconds. Approved 7-0-0

6) Approve agenda

- a) James Del Monaco motions to approve. Joseph Kilcoyne seconds. Approved 7-0-0

7) Announcements

a) CEC (Conferences and Expositions Committee)

- i) CEC is open to new session format proposals
- ii) Work with a track chair to put together a series of sessions that can be used as a mini-track
- iii) Putting together an entire track of programs in cooperation with other TCs is also encouraged; keeping in mind that track subjects are typically determined 14-15 months prior to a conference.
- iv) CEC's Standing Request for Future Society Meeting Program Track Suggestions – Now for Austin 2020 (Annual Conf)
- v) The Professional Development Committee (PDC) is seeking ideas for new ASHRAE Learning Institute (ALI) courses

b) RAC (Research Activities Committee)

- i) Increased frequency for RTARs and WSs. Added Aug 15 deadline.
- ii) Priority will be giving to RP's for the Residential Sector

c) TAC (Technical Activities Committee)

- i) MTGs that have been formed since Chicago Meeting – MTG.EBO (Effective Bldg. Operations)
- ii) MTGs that have been formed since Houston Meeting – MTG.HWBE (Health and Wellness in the Built Environment)
- iii) New TC formed: TC 2.10 (Resilience and Security)
- iv) TAC voted to disband MTG.BD, Building Dampness
- v) The link to TC-1.4 Basecamp is <https://basecamp.com/2681208/>
- vi) We'll use RPM (Remote Participation Meetings) 2019. **Each meeting chair is responsible for setting it up.** Apologies to those who couldn't connect via RPM to some TC-1.4 meetings this conference.
- vii) For all terminology doubts in publication, sessions, etc. use the definitions in the official ASHRAE glossary <https://xp20.ashrae.org/terminology/>

d) **YEA**

e) **TC1.4 Member Awards**

- i) Mike Pouchak was made Fellow Member
- ii) The TC-1.4 Awards Chair is back. **Update your ASHRAE Bio!!!**

8) OLD BUSINESS

a) PROJECT COMMITTEE AND ONGOING RESEARCH REPORTS

- i) **SSPC 135 (BACnet)**
 - (1) No attendance from SSPC 135
- ii) **SGPC 13 (Specifying Building Automation Systems) – Chariti Young**
 - (1) Effort to reorganize and rearchitect to account for cybersecurity and IoT.
 - (2) Additional work on how to specify fault detection and diagnostics.
 - (3) There will be three upcoming teleconferences to discuss proposed changes from SGPC members.
 - (4) The plan is to bring the revised items for a vote in the summer 2019 conference.
- iii) **GPC 36 (High Performance Sequences of Operation for HVAC Systems) – Jim Coogan**
 - (1) GPC 36P available in the ASHRAE bookstore and online.
 - (2) Voted on 4 items during this conference.
 - (3) Steve Taylor will role on as chair when Mark Hydeman rolls off.

b) SUB-COMMITTEE REPORTS

- i) **Executive – Marcelo Acosta**
 - (1) Looking for candidates to replace 3 voting members who roll off in July (Israa Ajam, Ron Bernstein, Marcelo Acosta)
 - (2) Looking for vice-chairs for Handbook, Research, and YEA
 - (a) Elise Backstrom appointed as YEA vice-chair
 - (3) TC's restructure – To be discussed at Main Meeting
 - (4) Macroblocks on hold until activities can be coordinated across TCs and Guideline 36 includes hydronics (ETA: July 2020)
- ii) **Control Components and Applications – Frank Shadpour on behalf of Chad Moore**
 - (1) New ideas for the TC to work on - research and seminars
 - (2) There was a lot of interest in topics including AI, machine learning, integration of IoT, specifically from the YEA group in attendance.
- iii) **Program – Frank Shadpour**
 - (1) 5 sessions sponsored and 4 co-sponsored at this conference
 - (2) 9 proposals for Kansas
- iv) **Education/YEA – Michelle Shadpour**
 - (1) The Instagram account "Millennial Engineer" will go live before the Kansas City conference.
 - (2) Larry Fisher's proposal for a course about "BAS wiring best practices" was approved.
- v) **Handbook – James Del Monaco**

- (1) Chapter 7 of Fundamentals – Started review
- (2) Handbook central:
<https://www.ashrae.org/technical-resources/ashrae-handbook/ashrae-handbook-central>
- (3) July 5, 2020 is the deadline for the Fundamentals controls chapter revisions.
- (4) The remote attendance was high during the subcommittee meeting.

vi) **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. Not voted yet
 - (b) Task 3 – First submission. Not voted yet
 - (c) Task 4 – Started
- (2) 1 RTAR approved and WS developed to be reviewed and submitted
 - (a) DOAs Supply Temperature Optimization.
 - (b) The work statement has been sent out to the TC for review and comment. This will be submitted before the March 15th deadline.
- (3) 4 other RTAR's & WS's under development
- (4) Kim indicated that there is a need for additional RTAR's and work statements; There are over 20 projects in the pipeline, but they need to be developed into RTAR's.

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 should be the liason
- 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
- xv) TC 1.6 (Terminology) – David Bornside
- 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

9) **Upcoming Deadlines**

- Kansas City Annual Conference - June 22 – June 26, 2019
- Seminar and Forum proposals for Houston are due by **Friday, February 8th, 2019.**
Conference
- Website: <https://www.ashrae.org/conferences/annual-conference>
- Conference Program Chair: Carrie Anne Monplaisir Email: cindym@tmmechanical.com

- Program Focus at Kansas City Annual Conference
 - i. Track 1: Systems & Equipment in the Built Environment
 - ii. Track 2: Fundamentals & Applications
 - iii. Track 3: Optimization in HVAC&R
 - iv. Track 4: Commissioning New & Existing Buildings
 - v. Track 5: Occupant Health & Safety
 - vi. Track 6: Modeling Throughout the Building Life Cycle
 - vii. Track 7: Professional Development
 - viii. Track 8: Research Summit
 - ix. Track 9: Radiant Heating & Cooling Mini-Track

10) New business

- Request from TAC to discuss the merging of TC to reduce the number from 98 to 30. (see attached letter from TAC)
- Marcelo Acosta presented the letter to the TC.
- Amir Jokar spoke further on proposed reorganization plan.
 - RAC wants feedback; the plan is not set in stone.
 - All TC members are requested to fill out and submit to the TC-1.4 chair, Marcelo Acosta; The chair will then consolidate the comments and send a single Feedback Form to RAC.
 - Per Amir, there is a lot of overlap in schedule between the Technical Programs (TP's) and Technical Committees (TC's); TAC sees up to 40% overlap between programs and subcommittee meetings as a whole; a proposed benefit is to allow programs in the morning and TC meetings in the afternoon.
- Steve Taylor suggested that if reducing meeting space is the intent, get rid of the main committee meeting onsite in order to keep the subcommittee meetings during the conference, potentially followed up by the main committee meeting after the conference.
- Frank Shadpour's suggestion is instead of merging TC's, add group meetings where 1-2 representatives from each TC meet with other related TC's. Chariti suggested that the intent of the Sections is to promote collaboration between TC's. The Section meetings may be able to be repurposed to meet this intent.
- Jin Wen suggested that even if TC 1.4 and 7.5 merged, they would likely need an identical amount of subcommittee meetings to cover the broad subject matter. The merged TC would have more than 400 members, which would make extremely difficult to find rooms for full committee meetings and hard to have any meaningful discussion.
- It was pointed out there were good reasons to split TC-1.4 and TC-7.5. Different focus and too many people made it unmanageable.
- Bogi Setty stated that many TC's have very little participation (under four people) but still book rooms for committee and subcommittee meetings, and part of this proposal is to have an exercise to dissolve or merge these TC's without much interest.
- Carol Lomanaco suggested that the even if the TC does not like the proposal, at the very least acknowledge that there are opportunities for additional collaboration, and this may be an opportunity to think about synergies with other groups.
- Kim Barker suggested that the mentoring/shadowing program available through DRC should be mimicked at the TC level.
- It was agreed there are opportunities for improvement in TC's coordination, which should be proactively pursued. Merging may be a solution for small TC but not for ours.

11) Next Meeting – Kansas City, KA | June 22 – June 26, 2019

12) Adjourn

TC 1.4 Control Theory and Application

YEA/Education Subcommittee Meeting Minutes

January 13, 2019

2:00-3:00pm

B319 GWCC, Bldg B

- 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.
 - ii) Videos
 - c) How to increase involvement of YEA members

- i) Social Media:

Instagram (Existing Topic)

PIC: Michelle Shadpour

Purpose: Increase presence on social media.

Status: Collecting Content.

Youtube (Existing Topic)

PIC: Elise Backstrom

Purpose: Easily accessible content.

Status: Collecting Content.

- d) A preview of the TC Seminar “Do you want to control the world?” was presented, eliciting great interest.

Michelle Shadpour

TC 1.4 Control Theory and Application

Control Components and Applications - Subcommittee Meeting Minutes January 13, 2019

3:00-4:00pm

B319 GWCC, Bldg B

Frank Shadpour chaired this meeting in Chad Moore's absence.

Discussion topics:

- 1) Topic by Gaylen Atkinson – VRF integration can be a challenge
- 2) Frank Shadpour – are other industries creeping into the BAS marketplace through IoT?
 - a. Issues presented by other attendees included cybersecurity and life safety
- 3) Larry Fischer – different approach and lack of consistency to programming; and how can programming be simplified to make it possible for systems to be uniform
- 4) Topics for future meetings / programs from around the room:
 - a. Updates to Standard 62.1 minimum VAV zone flow modifications
 - b. 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
 - c. What makes for maintainable programming code; organization, comments, meeting design intent?
 - d. 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
 - e. Fault Detection and Diagnostics to keep the built environment efficient; cosponsor a program with 7.9?
 - f. How do you make the unseen seen in building automation systems?
 - g. 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
 - h. New sources of data for integration – medical devices, wearables, etc.
 - i. Allow user requests into the BAS; specifically, into new Guideline 36 sequences
 - j. 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
 - k. ASHRAE classes and certifications on controls
 - l. How to bridge the gap of under control vs. over control (in terms of point qty)
 - m. Lack of integration in systems; the difference between open protocol and "plug and play"
 - n. Sequencing of HVAC systems based on energy performance of the space and occupant satisfaction; how can they be integrated together for total energy integration
 - o. How to convert from design to installation? Differences in styles in specifiers as well as installers as well as the maintenance staff
 - p. Airflow technologies – pitot tubes vs. thermal dispersion for VAV box airflow sensing, specifically for net zero buildings.
 - q. Cybersecurity updates to Guideline 13 by Ron Bernstein
 - r. API for Guideline 13 by Ron Bernstein;
 - s. Common graphics for Guideline 13 by Ron Bernstein;

- t. Common data point profiles for equipment and new sensors/actuators for Guideline 13 by Ask Ron Bernstein;
- u. Occupant behavior; can devices learn to adapt to the occupant needs through AI?

TC 1.4 Control Theory and Application

Programs Subcommittee Meeting Minutes

January 13, 2019

4:00-5:30pm

B319 GWCC, Bldg B

The subject meeting was held on Sunday, January 13, 2018 starting at 4:00 PM following the Components and Control Applications Subcommittee meeting. The attendees remained. Special thanks to the active members of TC 1.4.

Programs Presented in Atlanta: Jan 12 – Jan 16, 2019

1. Seminar 9: The Doctor is In! Diagnosing Common System Issues and Misapplications in Building Automation Systems

Chair: Frank Shadpour,

Track: Common System Issues and Misapplications

Sunday, 9:45 AM - 10:45 AM, Room: Building A, A4047

2. Seminar 37: Space Pressurization for Infection Control and Hospital Accreditation

Chair: Chad Moore

Track: Construction, Operation, and Maintenance of High Performance Systems

Monday, 11:00 AM - 12:00 PM Room: Building A, A305

3. Workshop 7: An Overview of the Newly Published Guideline 36

Chair: Mark Hydeman

Track: The Convergence of Comfort, IAQ, and Energy Efficiency Building

Wednesday, 8:00 AM - 9:30 AM Room: Building B, B407

4. TC 1.4 Special Seminar: Want to Control the World?

Chair: Michelle Shadpour

Track: Control Theory and Application

Tuesday, 1:00 PM – 1:30 PM

Room A302, 3rd Floor, Building A, Georgia World Congress Center

5. Seminar 68: Integration of Renewable Systems and Natural Ventilation: Control Challenges

Chair: Michelle Shadpour

Track: Renewables and Natural Systems

Wednesday, 9:45 AM - 10:45 AM Room: Building B, B309

Anticipated Programs for 2019 Atlanta That Did Not Take Place:

1. Debate: Control Component Nano-Blocks vs. Macro- Blocks. Is Bigger Better?

Chair: Marcelo Acosta

2. Seminar: Control of District Energy and Cogen Systems

Chair: Chad Moore (TC 6.2)

3. Seminar: Controlling the Braves New World!

Chair: Chariti Young

4. Seminar: Architecting Building Automation Systems – The convergence of IT, OT & IoT.

Chair: Ron Bernstein (SPC 135, Guideline 13)

5. Seminar: IAQ & Comfort through Building Automation Systems

Chair: Jim Coogan

Programs Proposed for 2019 Kansas City Summer Meeting Jun 22 - Jun 26, 2019

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. Workshop: The psychology of controls. How to become a subject matter Expert?

Chair: Dave Kahn

5. Seminar: YEA Fundamentals – Plug & Play Controls!

Chair: Elise Backstrom

6. Seminar: The Challenge of successful control implementation – Know how it operates before designing it!

Chair: Chariti Young

7. Seminar: Smart is as Smart does – Data integrated buildings!

Chair: Clay Nesler

8. Seminar: Minimizing Energy Use with Primary DOAS and Secondary Fan Powered Units in the Occupied Space!

Chair: Jim Coogan

9. Seminar: Too Many Alarms! What's the problem?

Chair: Carol Lomonaco

Program “Pipeline” for Future Meetings:

1. Seminar: How to Become a Building Automation Engineer?

Chair: Dave Kahn (YEA)

2. “Be Alarmed at what your BAS is not Telling You: Is no news really good news?”

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

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

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

6. Special Sensors: Contaminants and Microbial Sensors

7. Project Control Submittals – What should it include?

8. Designing Command and Control Center for Buildings and large campuses
9. Humidifiers and Humidity Control for Critical Spaces.
10. How to Assess the DDC systems of an Existing Facility?
11. What Is That Most Consulting Engineers Are Doing Poorly? How to Properly design and specify control systems?
12. Seminar: IAQ & Comfort through Building Automation Systems
13. Application of narrow AI in BAS, in the near future – Machine learning!

Tracks for 2019 Kansas City Summer Conference Jun 22 - Jun 26, 2019

- Track 1: Systems & Equipment in the Built Environment
- Track 2: Fundamentals and Applications
- Track 3: Optimization in HVAC&R
- Track 4: Commissioning New & Existing Buildings
- Track 5: Occupant Health & Safety
- Track 6: Modeling Throughout the Building Life Cycle
- Track 7: Professional Development
- Track 8: Research Summit
- Track 9: Radiant Heating & Cooling Mini-Track

Program (Seminar, Forum, Workshop, Debate and Panel) proposals are open for submission [here](#).
Also visit: <https://www.ashrae.org/conferences/annual-conference>

Deadlines

- 1/2/19 Website Opens for Seminar, workshop, Forum, Debate and Panel Proposals
- 2/8/19 Program (Seminar, Forum, Workshop, Debate and Panel) Proposals Due
- 2/8/19 Revised Conference Papers/Final Technical Papers Due
- 2/8/19 Extended abstracts due
- 2/19/19 Conference and Technical Paper Final Accept/Reject Notifications
- 3/7/19 Extended abstracts final accept/reject notifications
- 3/8/19 Extended abstracts scheduled for presentation

TC 1.4 Control Theory and Applications

Research Subcommittee (RSC) Activities

Atlanta – Jan 14 2019 2:30-4:30

RSC Meeting Minutes:

Hazelnut, Omni Hotel

1. Announcements

- a) Stats
 - RTARs: 6 Accepted with comments, 1 Rejected
 - WSs: 2 Conditionally accepted, 3 Returned
- b) Honors & Awards – need to submit nominees
 - Homer Adams Award
 - Innovative Research Grant (IRG) pre-proposals
 - NIA Awards
- c) Web-based Training Modules for RTAR, WS, PES and PMS.
- d) 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.
- e) Reminder:
 - RTARs and WSs should be reviewed by liaison prior to submission to RAC. TC 1.4 Research Liaison is Shinsuke Kato RL1@ashrae.net and Art Giesler RACvchair@ashrae.net

Active Project Status:

Name	Project	PMS	Status
RP-1455			TC NEEDS TO PROVIDE COMPLETED DISPOSITION OF ASHRAE RESEARCH RESULTS FORM TO MORTS TO CLOSE-OUT PROJECT
RP-1587			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 Willow M3, 9:30am Task 3 -programming of sequences
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	WS sent to TC1.4 members for review/comment.

3. Possible Research Project Status:

Status	Other TCs	Project	Champion	Remarks
RTAR-1832	Co-sponsor TC7.5	Applied Performance of Control Loops (RP-1587 Part 2)	Zheng O'Neill Kim Barker Hwakong Cheng	<u>RESUBMIT RTAR Or DROP</u>
RTAR	Co-sponsor TC	Common GUI system graphics for BAS Operators	Marcelo Acosta Kim Barker Barry Bridges John Wallace	Discussion topics: Identify minimal data set required for functional objects. Same data, different look to GUI. How many clicks do you need to achieve function? Start with survey study (core functions). RP-1633. What should be on the GUI (e.g., GP36). GPC-13 what needs to be delivered, examples show different options..
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		Specifying BAS graphics (Data sets, functional objects)	Ron Bernstein	
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 with DxVarSpd compressors (varspd, fixed & varspd).

Status	Other TCs	Project	Champion	Remarks
RTAR	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.
IDEA NEW	7.5	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! <i>BAS Alarm Management for Operation and Maintenance Decision Making (CH-18-C001)</i> Validation of GPC36 alarms.
WS		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	Near-optimum sequences developed from model predictive controls that are too cumbersome to work in real-time control systems.
IDEA	TC7.6	Cost & benefits of commissioned building controls	David Underwood Joe Zhou	When does building performance start to degrade? Persistence of controls – TC7.6 Control persistence by ComEd (28 bldgs). Interest for more wide research. Discuss in Atlanta.
Make Seminar	Co-sponsor TC1.5	Survey Near field communications (NFC) use for BAS	Carol Lomonaco Joe Zhou	What is the applicability of this communication Hackers, Security impact, Seen in commissioning valve actuators, small devices (use your phone).. www.nearfieldcommunication.org
		Control Spec builder for GPC36		SOO builder sw tool – not research. Related to GPC-13 tool. Electronic publication, not research

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: 4:30 pm

TC 1.4 Control Theory and Application

Handbook Subcommittee Meeting Minutes

January 14, 2019

4:30-6:00pm

Hazelnut, Omni Hotel

1. CALL TO ORDER

2. REPORT FROM APPLICATIONS HANDBOOK LIAISON (Bryan Holcomb)

- 2.1. Chapter 47, "Design and Application of Controls" was submitted prior to the Annual Conference in Houston (June 2018). Expect proofs between November 2018-January 2019.
- 2.2. Applications Handbook is being issued in 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 team has started to edit 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. Recommend members review Chapter 7 prior to the January meeting in Atlanta. Focus on identifying outdated, wrong, or missing information. We want to capture any state-of-the art equipment, devices, features, etc.
- 4.4. 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.
- 4.5. The chapter will be split up into several sections.
 - 4.5.1. James 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. Chariti will review the Networks and Specifying Building Automation Systems sections.

5. NEXT MEETING AND SCHEDULE

- 5.1. 4: 00-6:00 Monday June 24, 2019 Annual meeting in Kansas City, MO.

6. Adjourn

Adjourn at 6:00

TC 1.4 Handbook Subcommittee Attendance List

Present	Name	
X	James Del Monaco	
	Barry Bridges	
X	Chariti Young	
X	Dave Kahn	
	Chad Moore	
X	Marcelo Acosta	
	Charlotte Dean	
X	Chris Miller	
X	Terry Schroeder (Remote)	
X	Riad Assaf (Remote)	
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 PMS Meeting Minutes

January 15, 2019

9:30-10:30am

Willow, Omni Hotel

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

Attendance

For the PI	For the PMS
Steve Taylor	Marcelo Acosta
Reece Kiriu	Joseph Kilcoyne
Brandon Gill	
Ed Morris	(3 absent members)
Chirag Parikh	

Guests: 7

- 1) The PI presented the progress status:
 - a. A revised version of Task 2 deliverables (the SOO's) was submitted on Jan 8
 - b. A partial version of Task 3 deliverables (program code) was submitted on Nov 2018. It's for a specific plant configuration.
 - c. Task 4 (debugging Task 3) has started
- 2) The PMS will review the deliverables for Task 2 vote the by February 10.
- 3) The PMS will provide feedback to the PI on the Task 3 partial deliverable by Feb 25.

Adjourned at 10:15