



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 1/24/2018

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

DATE OF MEETING Jan 23, 2018 LOCATION Chicago

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Marcelo Acosta	2017	Mark Hydeman	2017	Corresponding – 6
James Del Monaco	2017	Ron Bernstein	2015	Provisional – 4
Joe Kilcoyne	2017			Guests – 28
James Coogan	2014			
Michael Pouchak	2014			
Chariti Young	2017			
Jin Wen	2017			
Israa Ajam	2017			

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 (Unapproved)

TC 1.4 Control Theory and Application

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

Tuesday, January 23, 2018 1:00 – 3:30 pm Salon 4/5 (3) Palmer House Hilton Chicago, IL

“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	Salon 4/5	(3)
TC 1.4 YEA/Education	Sunday 2:00 PM	Sandburg 2	(7)
TC 1.4 Control Components and Applications	Sunday 3:00 PM	Sandburg 2	(7)
TC 1.4 Programs	Sunday 4:00 PM	Sandburg 2	(7)
TC 1.4 Research	Monday 2:30 PM	Dearborn 1	(7)
TC 1.4 Handbook	Monday 4:30 PM	Dearborn 1	(7)
RP-1747 DCV for Multiple Zone Systems	Monday 6:30 PM	Dearborn 1	(7)
TC 1.4 Executive	Tuesday 8:30 AM	Burnham 2	(7)
TC 1.4 RP-1711 SOO's for Hydronic Systems	Tuesday 9:30 AM	Burnham 2	(7)

Debate 1: BAS Graphics: Integrating Multiple Masters. Who is the boss? Sunday 8:00-9:00a

Seminar 24: Seminar 24: Building Automation Solutions to Code Monday 9:45-10:45a
Compliance in Hospitals

TC1.4 Seminar: TC 1.4 TC Seminar: Building Automation, Social Media Tuesday 1:00-1:30p
and Millennials! What do they have in common?

Seminar 51: Controls Systems Best Practices: How to make the Control Tuesday 3:15-4:45p
System a Success, Part 2

1) Call to Order

2) Introduce Members, Guests, and Liaisons

3) Roll Call (Quorum)

<input checked="" type="checkbox"/>	Marcelo Acosta, 6/30/19	<input type="checkbox"/>	Mark Hydeman, 6/30/21
<input checked="" type="checkbox"/>	James Del Monaco, 6/30/21	<input checked="" type="checkbox"/>	Chariti Yung, 6/30/21
<input checked="" type="checkbox"/>	Joe Kilcoyne, 6/30/19	<input type="checkbox"/>	Ron Bernstein, 6/30/19
<input checked="" type="checkbox"/>	Jim Coogan, 6/30/18	<input checked="" type="checkbox"/>	Israa Ajam, 6/30/21
<input checked="" type="checkbox"/>	Michael Pouchak, 6/30/18	<input checked="" type="checkbox"/>	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 agenda

- a) Mike P motions to approve. Jin seconds. Approved 8-0-0

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

- a) Barry B motions to approve. Mike P seconds. Approved 8-0-0

7) Announcements

- a) Section Meeting announcements
- b) **TAC**
 - i) New MTG has been formed: MTG.EBO Effective Building Operations
 - ii) Seminar/forum/workshop submission deadline: February 9th
 - iii) Useful info for TC members found in the "Procedures, Forms..." section of <https://www.ashrae.org/standards-research--technology/technical-committees>
 - iv) The TC's master calendar is now available through Google if you have an account. Just add techservices1791@gmail.com as a friend's calendar.
 - v) The Professional Development Committee is seeking ideas for new ASHRAE Learning Institute courses
 - vi) ASHRAE Historical Committee is looking for articles, papers, and sessions to celebrate the society upcoming 125 years. Topics should be on the advances developed and promoted by ASHRAE. Contact: Emily Sigman esigman@ashrae.org Abstracts due Feb 28.
 - vii) New Minutes
- c) **RAC**
 - i) Increased frequency for RTARs and WSs. Added March deadline.
 - ii) PMS training coming up in April
 - iii) Priority will be giving to RPs for the Residential Sector
- d) **YEA**
- e) **TC1.4 Member Awards**
 - i) Steven T. Taylor, P.E. received the F. Paul Anderson Award "Given in recognition of notable achievement, outstanding work, or service in any field of the Society"
 - ii) Taylor Engineering received an Award for Engineering Excellence in Category II (Other Institutional Buildings) for the San Francisco Museum of Modern Art

8) OLD BUSINESS

- a) PROJECT COMMITTEE AND ONGOING RESEARCH REPORTS
 - i) SSPC 135 (BACnet)
 - ii) SGPC 13 (Specifying Building Automation Systems) – Kris Kinney
 - (1) Making YouTube videos to provide guidance on SGPC 13.
 - iii) GPC 36 (High Performance Sequences of Operation for HVAC Systems) – Mark Hydeman
 - (1) GPC 36P is expected to be published in July 2018.

b) SUB-COMMITTEE REPORTS

- i) **Executive** – Marcelo Acosta
 - (1) Roster updated
 - (2) Voting items
 - (a) None.
- ii) **Control Components and Applications** – Chad Moore
 - (1) Discussion on ASHRAE creation of HVAC Macroblocks specifications.
 - (2) Guest Speaker – Christen Hansen (ISO-1457)
- iii) **Program** – Frank Shadpour
 - (1) 4 sessions at this conference
- iv) **Education/YEA** – Michelle Shadpour
 - (1) Successful introduction of TC activities to guests
 - (2) Creation of an Instagram account for the TC, targeting young audiences. Little content so far.
 - (3) YouTube channel also with almost no content.
 - (4) Wiki site root completed under https://en.wikiversity.org/wiki/Building_Automation
 - (5) Looking for contributors for these 3 projects.
- v) **Handbook** – James Del Monaco
 - (1) Chapter 47 – Finished review
 - (2) Motion by Barry B. to approve changes. Seconded by Mike P.
 - (3) Subject to review by the voting member. Vote needed by March 1st.
- vi) **Research** – Kim Barker
 - (1) 1746-RP (Validation of RP-1455 Advanced Control Sequences for HVAC Systems – Air Distribution and Terminal Systems) – Terminated
 - (a) Verification will be done in real sites, as GPC36P is already being used
 - (2) 1711-RP (Advanced Sequences of Operation for HVAC Systems – Phase II Central Plants and Hydronic Systems) – Marcelo Acosta
 - (a) PMS formed.
 - (b) 1st report submitted
 - (3) 1747-RP DCV Standard 62.
 - (a) Finished.
 - (4) WS – Effective BAS User Interfaces under development
- vii) **Standards** – Steve Taylor
 - (1) 90.1 changes to humidity control
 - (2) 90.1 heat recovery for hospitals & natatorium
- viii) **Webmaster** – Joseph Kilcoyne / Mike Pouchak

c) COMMITTEE LIASION REPORTS

- i) TC 1.5 (Computer Applications) – Mike Pouchak.
 - (1) New research on BIM building energy from multiple parties.
- ii) TG 2 HVAC Security – Kim Barker
 - (1) Guideline 29 will be presented for draft soon.
- 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 Lin
 - (1) Alarm hierarchical management - RTAR in process.
 - (2) Request for participation in a metadata integration RP.
 - (3) About to submit chapter 42 (Supervisory Control)
- viii) TC 7.6 (Systems Energy Utilization)
- ix) TC 7.9 (Building Commissioning) – David Bornside
- x) TC 9.10 (Laboratory Systems) – Jim Coogan

- (1) Upcoming half day seminar on Lab Controls
- xi) TC 9.11 (Clean Rooms) – Phil Naughton should be the liason
- (1) RP1604 – Demand control ventilation, being completed.
- (2) Guide book is published.
- 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) New business

- a) None noted.

10) TC1.4 Roster Update

- a) None
- b) 2 Voting members roll out on June 2018

11) Upcoming Deadlines

- a) For Winter Meeting in Chicago, IL January 20 – 24, 2018
 - i) **February 9th, 2018** Seminar, Forum and Workshop Proposals Due.
 - ii) **Houston Conference Tracks**
 - **Track 1: HVAC&R Systems and Equipment**
 - **Track 2: Fundamentals & Applications**
 - Track 3: District Energy and Cogeneration Plants NEW!
 - Track 4: Safeguarding our HVAC&R System NEW!
 - Track 5: Residential: Modern Buildings in Hot & Humid Climates
 - Track 6: Professional Skills
 - Track 7: Research Summit
 - **Track 8: HVAC&R Control Freaks NEW!**
 - **Track 9: HVAC&R Analytics NEW!**

12) Next Meeting – Houston, TX June 23 to June 27, 2018

13) Adjourn



TC 1.4 Control Theory and Application

YEA/Education Subcommittee Meeting Agenda

Chicago – January 22, 2017

2:00-3:00pm

Sansberg

- 1) Introductions
- 2) Young Engineers in ASHRAE (YEA) attendance
- 3) Discussion Topics
 - a) Overview of TC 1.4 Activities and Subcommittees
 - i) Subcommittees – education, programs, research, handbook
 - ii) **Active Research Project(s):**
 - **RP-1711** - Advanced Sequences of Operation for HVAC Systems
 - **RP-1746** - Field Validation of RP-1455 Sequences
 - **RP-1747** - Implementation of DCV for Multiple Zone Systems
 - b) Activities
 - c) Social Media:
 - i) Instagram (Existing Topic)

Purpose: Increase presence on social media. Account launched in December... looking for post ideas and content from other's.
 - ii) YouTube (Existing Topic)

Purpose: Provide a location for HVAC videos. Idea proposed about posting "other's" videos. Can create playlists to "share" other's relevant videos.
 - iii) Wiki (Existing Topic, Root Complete)

Purpose: Provide single online location as a combined source for sharing and finding information.
 - iv) Twitch (New Topic)



Purpose: Potential social media platform for live streaming discussion topics. Allows for more people outside of ASHRAE to participate in TC1.4 discussions.



TC1.4 Control Components & Applications

Chad E. Moore, P.E., LEED
Chair, Control Components &
Applications Subcommittee

Reply to: **Engineering Resource Group**
350 Edgewood Terrace Drive
Jackson, MS 39206-6216
Tel: 601.362.3552
Fax: 601.366.6418
cmoore@ergms.com

TC1.4 Control Components & Applications Subcommittee Meeting

Meeting Date: January 21, 2018, 3:00 -4:00 pm
Palmer House Hilton Floor 7: Sandburg 2

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

Minutes:

1. Introductions

- Attendees: 24
- YEA members: 8

2. TC1.4 Announcements

YEA/Student Mixer

Sat. (01/20/18), 5:00 pm–6:30 pm
Location: Palmer House, Red Lacquer Room
*Mix and mingle with YEA members.
Meet new friends; gain insight into life after college;
and enjoy free food.*

Debate 1 (Intermediate)

Building Automation System Graphics: Integrating Multiple Masters, Who Is the Boss?
Sun. (01/21/18), 8:00 am–9:00 am
Track: Systems and Equipment
Room: Adams

Seminar 24 (Intermediate)

Building Automation Solutions to Code Compliance Challenges in Hospitals
Mon. (01/22/18), 9:45 am–10:45 am
Track: Standards, Guidelines, and Codes
Room: Red Lacquer (4th Floor)

Seminar TC

Building Automation, Social Media and Millennials! What Do They Have in Common?
Tues. (01/23/18), 1:00 pm–1:30 pm
Track: Fundamentals and Applications
Room: Salon 4/5
(No badge required)

3. Discussion Topics

- Vision for the future of controls.
 - Marcelo Acosta (TC1.4 Chair) presented “A Vision for the Future of HVAC”.



TC1.4 Control Components & Applications

- The presentation slides are attached at the end of these meeting minutes.
- The current typical Building Automation System (BAS) design, installation, commissioning and operation processes were discussed.
- Often the BAS does not meet the designer's or Owner's performance and operability expectations. There are many reasons for this however, several key issues were discussed including; ambiguous project specifications, unavailability of part load simulation software tools, insufficient system testing and commissioning, and poor BAS user interfaces.
- ASHRAE currently has many resources including Handbooks, Standards, and Guidelines that provide insight on how to design, commission and operate BAS's. However, none provide a comprehensive standard for same (with the exception of ASHRAE Guideline 36P which is currently out for public review).
- A proposed solution to these issues was introduced. Provide baseline detailed and thoroughly tested BAS designs for subsystems in modular packages. Example subsystems include; Air Handling Units, Packaged Rooftop Units, Fan Coil Units, VAV Terminal Units, Chilled Water Plants, and Heating Water Plants.
- There will be a need to further expand Guidelines 36 and 13 to include additional equipment/systems, standardize BAS integration and standardize BAS graphics and user interface.
- Part load simulation software will be required to be developed and should be capable of simulating the standard sequences of operation developed.
- Performance data from equipment manufacturers will be required for input into the simulations.
- Benefits to this approach include:
 - Designers could provide detailed, unequivocal, state-of-the art, tested/commissioned proven designs, within the budget and time constraints (simplifies design process, uses proven sequences of operation).
 - Easy for designers to incorporate new technologies.
 - Equipment and controls companies work together to develop and thoroughly test the modules. (build in flexibility to provide upgrades).
 - Standardize BAS integration.
 - Standardize BAS user interface.
 - BAS contractor focuses on integration, optimization, and user interface rather than programming unit controllers.



TC1.4 Control Components & Applications

- Sustained high-performance overtime.
- How can TC1.4 move this forward, get buy in from other ASHRAE Technical, Guideline, and Standard Committees? TC1.4 to engage the following ASHRAE Committees:
 - TC1.5 Computer Applications.
 - TC1.3 Optimization.
 - TC4.7 Energy Calculations.
 - Guideline 36P.
 - Guideline 13.
 - Perhaps develop new Guideline.

4. **Future CCA Subcommittee discussion topics:**

- BAS and IoT.
- How does IT and OT work together.
- New control components.
- New BAS applications.
- BAS security.

5. **Other Business**

6. **Meeting was adjourned at 4:05 p.m.**



ASHRAE Technical Committee 1.4
Control Theory and Application

Controls Components & Applications Subcommittee

2018 Winter Conference (Chicago)



Background

1. Question about a diagram in Guideline 36P (Advanced SOO's) is answered: "Diagrams are just illustrative; the scope is just the SOO's"
2. Guideline 13 (Specifying BAS), Guideline 36P, BACnet (Integrated systems), Standard 189.1 (High Efficiency Bldgs), Integrated Bldgs Delivery
 1. All point to more standardized, integrated, and efficient systems
 2. What happens when you put them all together? How does it look like?
What's ASHRAE's (implicit) vision?
 3. What's missing?

"Start by doing what's necessary; then do what's possible; and suddenly you'll find yourself doing the impossible"

Key Requirements

1. Construction process right from the beginning: detailed, clear, unambiguous specifications for state-of-the-art systems
 1. Requires reusable, carefully developed, thoroughly tested, highly efficient designs
 2. Verified for the specific project using detailed part load simulation software, with actual equipment part load performance data
 3. Requires (easy) methods for incorporating new technologies
2. Ensure proper delivery
 1. Requires understanding by all parties involved, and realistic manufacturability
3. Ensure proper ongoing commissioning
 1. Systems include self testing functions with all required sensors
 2. Commissioning procedures for features that can be automatically tested
4. Ensure proper operation
 1. Insightful, meaningful, action oriented BAS user interfaces

Current status

1. Systems design: Handbooks, 189.1, Guideline 36P
2. Part load simulation software
3. Equipment part load performance data
4. Incorporation of new technologies
5. Integration: Guideline 13, BACnet
6. Commissioning & Testing: (Many depending on system, equip., & application)
7. Ongoing performance

The “designer builds everything from components” approach is too complex and time consuming.

Leads to recycling old, inefficient, incomplete designs.

Proposed solution

1. Provide baseline detailed and thoroughly tested designs for subsystems in modular packages: Air Handlers / Rooftops + VAVs; Chiller Plant / Boiler Plant + Fan-coils → New Guideline (?)
2. Guideline 36 to provide the SOO's, with self-diagnostics.
3. Guideline 13 to define the integration (over BACnet) and GUIs.
4. Develop part load simulation software and require the modules manufacturers to provide the data required by the software.
5. Encourage designers to build from those modules

Proposed solution - consequences

1. Designers could provide detailed, unequivocal, state-of-the-art, tested and proven designs, with the budget and time frames they currently have (and less risk)
2. Easy for designers to incorporate new technologies
3. Manufacturers and controls companies work together to develop and thoroughly test the modules, with properly matched and complete equipment & controls
 1. They can provide optional upgrades, but if disabled, they have to meet the baseline
 2. ASHRAE guidelines make modules integration easy

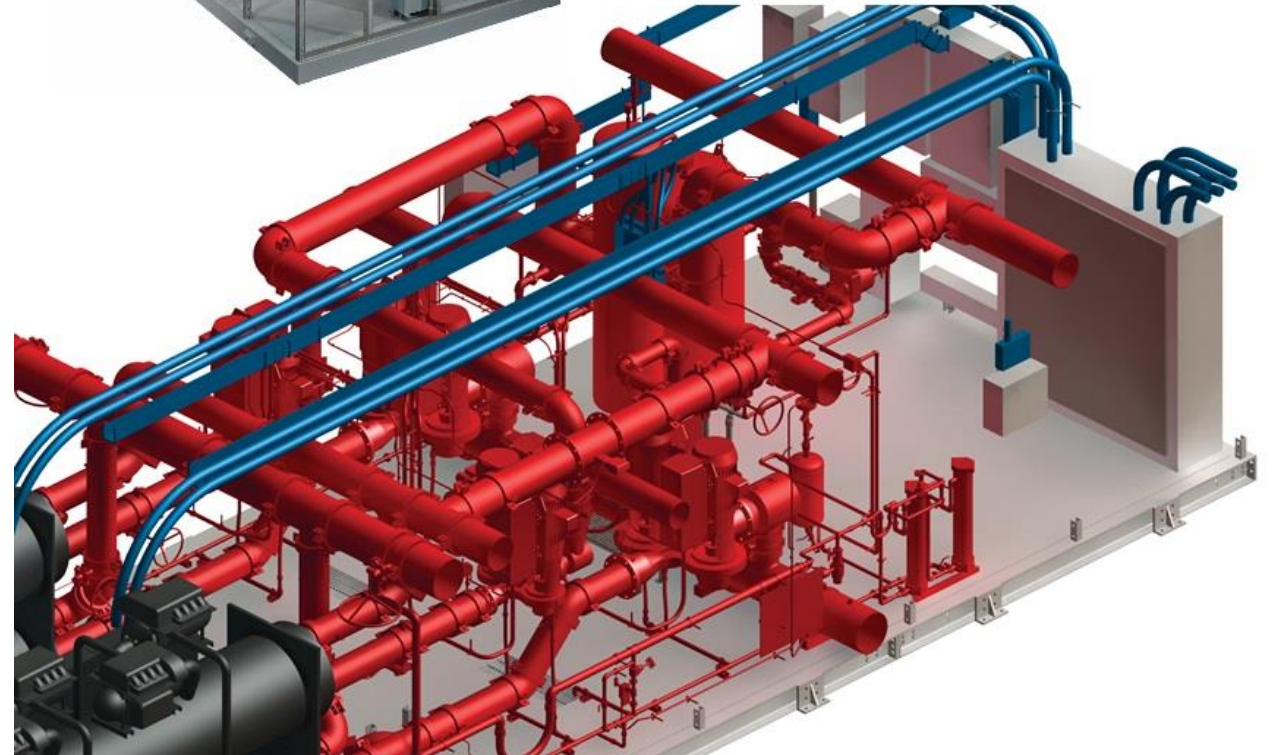
Proposed solution - consequences

4. Less “components” make understanding by everyone easier
5. Much better documented and self-testing modules make verifying and maintaining peak performance easier
6. Standard modules “sizes” makes integration easier
7. Controls contractors (Division 25) can focus on integration, optimization, operators user interface, and prioritizing corrective actions

ASHRAE VISION FOR THE FUTURE OF HVAC

Controls components & Applications
2018 Winter Conference

How does this look like?



Existing elements

1. Guideline 13
2. Guideline 36P
3. Standard 189.1
4. BACnet
5. ASHRAE willingness to improve the construction process from design to maintenance to improve systems efficiency and reliability
6. Existing packaged equipment with integrated stand-alone controls: rooftops, air handlers, chillers, boilers, boosters...

Missing elements

1. Baseline detailed and thoroughly tested designs for subsystems in modular packages: Air Handlers / Rooftops + VAVs; Chiller Plant / Boiler Plant + Fan-coils → New Guideline (?)
2. Part load simulation software
3. Data from manufacturers
4. Buy in from designers
5. Updates to Guideline 36P and Guideline 13
6. ???



TC 1.4 – PROGRAM SUBCOMMITTEE ASHRAE WINTER MEETING CHICAGO - JANUARY, 2018

The subject meeting was held on Sunday, January 21, 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 Chicago:

Jan 20 - Jan 24, 2018

- 1. Debate 1: Building Automation System Graphics: Integrating Multiple Masters, Who Is the Boss?**
Chair: Marcelo Acosta,
Monday, 8:00 AM - 9:00 AM, Room: Adams
- 2. Seminar 24: Building Automation Solutions to Code Compliance Challenges in Hospitals**
Chair: Frank Shadpour
Monday, 9:45 AM – 10:45 AM, Room: Red Lacquer (4th Floor)
- 3. TC 1.4 Seminar: Building Automation, Social Media and Millennials! What Do They Have in Common?**
Chair: Marcelo Acosta
Tuesday, 1:00 PM – 1:30 AM, Room: Salon 4/5
- 4. Seminar 51: Control System Best Practices: How to Make the Control System a Success, Part 2**
Chair: Israa Ajam
Tuesday, 3:15 PM – 4:45 PM, Room: Adams



Anticipated Programs for 2018 Chicago That Did Not Take Place:

1. Seminar: **Air Flow Control Performance – Defining and Measuring**
Chair: Jim Coogan (Cosponsor TC 9.10)
2. Workshop: **How do we control the pressurization is Hospitals?**
Chair: Chad Moore (Cosponsor 9.6)
3. Forum: **Marry the Mission, Date the Method? Making ASHRAE Relevant to Millennials!**
Chair: Michelle Shadpour (TC7.5 Cosponsor)
4. Seminar: **Advance sequences are optimal – Getting there, Not so much!**
Chair: James Del Monaco
5. Seminar: **Field Vs. Factory program control – How do you specify both?**
Chair: Charity Young
6. Seminar: **Integrating BAS data into the IoT.**
Chair: Joseph Kilcoyne



Programs Proposed for 2018 Houston Summer Meeting

June 23 – June 27, 2018

1. Seminar: **Air Flow Control Performance – Defining and Measuring**
Chair: Jim Coogan (Cosponsor TC 9.10)
2. Workshop: **How do we control the pressurization in Hospitals?**
Chair: Chad Moore (Cosponsor 9.6)
3. Seminar: **Advance sequences are optimal – Getting there, Not so much!**
Chair: James Del Monaco
4. Seminar: **Field Vs. Factory program control – How do you specify both?**
Chair: Charity Young
5. Seminar: **Integrating BAS data into the IoT.**
Chair: Joseph Kilcoyne
6. Seminar: **Division 25 Challenges! When Integrated Automation Isn't!**
Chair: Ron Bernstein
7. Debate: Control Component Nano-Blocks vs. Macro- Blocks. Is Bigger Better?
Chair: Marcelo Acosta
8. Seminar: Control of District Energy and Cogen Systems
Chair: Chad Moore
9. Panel Discussion: **Control Freakonomics – Wanabees & Winners!**
Chair: Michelle Shadpour
10. Seminar: How to Assess the DDC systems of an Existing Facility?
Chair: Frank Shadpour



Program “Pipeline” for Future Meetings:

1. “Be Alarmed at what your BAS is not Telling You: Is no news really good news?”
2. Web-Services. XML, SOAP: How Do I Get Non-Traditional BAS Information and Use It for My Building Automation.
3. Controls for Fuel cells, Cogeneration and Micro-cogeneration, Renewables
4. Data Analytics... What interesting information can be derived from BAS data?
5. Special Sensors: Contaminants and Microbial Sensors
6. Project Control Submittals – What should it include?
7. Designing Command and Control Center for Buildings and large campuses
8. Humidifiers and Humidity Control for Critical Spaces.
9. How to Assess the DDC systems of an Existing Facility?
10. What Is That Most Consulting Engineers Are Doing Poorly? How to Properly design and specify control systems?

Proposed Tracks for 2018 Houston Summer Meeting

June 23 - June 27, 2018

1. HVAC&R Systems and Equipment
2. Fundamentals and Applications
3. District Energy and Cogeneration Plants
4. HVAC & Resiliency: Safeguarding our World
5. Residential – Modern Building in Hot and Humid Climates
6. Professional Skills
7. Research Summit
8. HVAC&R Control Freaks
9. HVAC&R Analytics



Houston 2018 Summer Meeting Deadlines:

- Thursday, January 11, 2018: Website Opens for Seminar, Workshop, Forum, Debate Proposals
- Monday, January 15, 2018: Conference Paper Accept/Revise/Reject Notifications
- Friday, February 9, 2018: Program (Seminar, Forum, Workshop, Debate and Panel) Proposals Due
- Friday, February 9, 2018: Revised Conference Papers/Final Technical Papers Due
- Monday, February 19, 2018: Conference and Technical Paper Final Accept/Reject Notifications
- Tuesday, March 1, 2018: Registration Opens
- Monday, March 19, 2018: Seminar, Forum, Workshop Accept/Reject Notifications
- Monday, April 30, 2018: Upload of PPTs Begin
- Friday, June 1, 2018: All PPTs Due Online
- Wednesday, June 20, 2018: Final Day for Commercialism Revision Upload prior to on-site
- Saturday, June 23, 2018: Speaker's Lounge Opens
- Conference begins (June 23 – 27, 2018)

Presentations and Guidelines:

1. *Conference Paper vs. Technical Paper:* Conference paper is limited to eight (8) pages, the timeline is shorter and the review process less rigorous than the technical papers currently presented in the Technical Paper Sessions.
2. *Seminar and Forum Submissions:* For Seminar submissions, they should include six (6) Learning Objectives and ten (10) Questions and Answers for the session.
3. *Seminar Program Submission:* 60 minutes (1-2 speakers) or 90 minutes (3-4 speakers).

Upcoming Meetings:

2018	Summer	Houston, TX
2019	Winter	Atlanta, GA
2019	Summer	Kansas City, MO



Reminder:

- *Conference Paper vs. Technical Paper:* Conference paper is limited to eight (8) pages, the timeline is shorter and the review process less rigorous than the technical papers currently presented in the Technical Paper Sessions.
- *Seminar and Forum Submissions:* For Seminar submissions, they should include six (6) Learning Objectives and ten (10) Questions and Answers for the session.
- *Seminar Program Submission:* 60 minutes (1-2 speakers) or 90 minutes (3-4 speakers).
- **ASHRAE Announcement:** Conference, presentations will be REQUIRED to be uploaded before the conference opening onsite. If a presentation is not uploaded, the presenter will be assessed a strike, within our 3 strike program. If a presenter collects three strikes, he/she will not be selected to present at another ASHRAE conference.

These minutes stated herein were approved by TC1.4 program subcommittee on Sunday, January 21, 2018.

Submitted by: Frank Shadpour, PE
TC1.4 Program Subcommittee Chair
frank@scengineers.net

RSC Meeting Minutes:

1. Announcements

a) Tech Council

- RAC to look into more “Applied” Research
- Evaluate the concept of allocating Research funds for post project processing that will produce tools, presentations, etc. that add value to the membership and society (not just ASHRAE, but aligns with our mission)
 - (1) Could be a second bid package for the post “data” research project to perform “applied research to make the tool.
 - (2) Could be a line item budget for hiring outside services to “finish” the holistic research project not just Work Plan scope.

b) Updates

- Updated Research Manual will be posted after St. Louis. New milestones for PMS and other changes.
- Training material is being reviewed for placement on ASHRAE website
- RAC will place emphasis on PMS training (Chairs & committee) with new milestones.
- Research database is online with about 250 projects with more to follow.

c) Stats

- RTARs: 3 Accepted, 0 Rejected
- WSs: 1 Conditionally accepted, 3 Returned

d) Honors & Awards – need to submit nominees

- Service to ASHRAE Research – Sept 1st
- Homer Addams Award – Graduate Student with published paper – Dec 15.
- New Investigators Award – Dec 1st. One was just awarded from 16 nominations.
- Grant-in Aid – Mar 1st

e) Web-based Training Modules for RTAR, WS, PES and PMS.

f) 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.

g) 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

2. Active Project Status:

Name	Project	PMS	Status
RP 1746 <i>Terminated Contract</i>	Field Validation of RP1455 Sequences	Chad Moore Kim Barker Kevin Ng Chariti Young	RAC terminated contract with PI (Penn State). Functional tests will be picked up by other projects. Revisit in June 2018.
RP-1747 TC 4.3 w/1.4 Co-Sponsor	Implementation of RP-1547 CO2-based Demand Controlled Ventilation for Multiple Zone HVAC Systems in Direct Digital Control Systems	Stanke, chair Len Damiano Raj Daswani Heejin Cho	<i>Completed October 2017 approved final report. Technical paper and journal paper needs to be completed.</i>
RP-1711	Advanced Sequences of Operation for HVAC Systems – Phase II Central Plants and Hydronic Systems	Barry Bridges Marcelo Acosta Steve Taylor	Kicked off, Completed first deliverable from Task 1. 100 different project sequences. PMS members from TC6.1 need to be identified.
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	RP-1661 was awarded to U of Miami. (May2017).

3. Pending Research Project Status:

Status	Project	Champion	Remarks

4. 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 ONeill Kim Barker Hwakong Cheng	TC1.4 and TC7.5 voted to support this RTAR Did RAC vote on this RTAR-1832.
RTAR		Common GUI system graphics	Marcelo Acosta Kim Barker Barry Bridges John Wallace	Send email to TC0104.Res@ashrae.org if interested in participating in development of this RTAR. WS draft completed early March 2018.
RTAR		Phase2 RP-1747	Zheng ONeill Hwakong Cheng Steve Taylor	See if sequences are good for other bldg types. Look at cost base reset strategies.
RTAR		DOAS supply air temperature reset for VRF and WSHP systems	Jim Coogan Steve Taylor Joe Zhou	Reset logic is not straight forward due to heat recovery that occurs between interior and exterior zones. Jim to work on RTAR, get feedback from Steve & Joe
RTAR		%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 don't match.
WS	Co-sponsor TC 6.1	Selecting Control Valves	Steve Taylor Carol Lomonaco	Work statement under development.
IDEA	TC5.3	Optimized control of Active Chilled Beam and Vav Cooling Terminal	Kim Barker	Need to develop RTAR
IDEA		Reset of space setpoints seasonally or using online daily forecast	Kim Barker Gwelen Paliaga	Determine if comfort and efficiency are improved by using seasonal space temperature setpoint reset or using next-day forecast obtained via internet. Also using forecast for pre-cooling strategies. Could start with simulation followed by real-building studies.

Status	Other TCs	Project	Champion	Remarks
IDEA	Co-sponsor TC7.9?	Effectiveness of Night Setback and Optimum Start	Gregory Cmar Kim Barker	How does BAS operator ensure reliable performance of SSTO?. What training is required to support SSTO? What performance monitoring is required to ensure operation? How do you commission SSTO? Functional test for SSTO?
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.
IDEA		Controlling HVAC using effective temperature (ET)	Joe Zhou	Does using ET instead of drybulb temperature reduce energy efficiency? Simulation followed by field test. Joe looking for grad student to develop this.
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	7.9	Cost & benefits of commissioned building controls	David Underwood	When does building performance start to degrade? What are top ten items to look at on scheduled basis?
IDEA	7.5?	Mixed-Mode Building Control Sequences	Kim Barker	What is the current state of mixed-mode control sequences? What are people doing? What is recommended? Literature search,
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!
NEW IDEA	Co-sponsor TC1.5	Survey Near field communications(NFC) use for BAS	Carol Lomonaco	What is the applicability of this communication Hackers, Security impact, Seen in commissioning valve actuators, small devices (use your phone).. www.nearfieldcommunication.org

5. 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

6. Adjourn: 3:57 pm

7. In Attendance: See attached sheet.

MINUTES

TC 1.4 Handbook Subcommittee

January 22, 2018 / 4:30 – 6:30

Palmer House – Dearborn 1

1. **CALL TO ORDER**
2. **REPORT FROM APPLICATIONS HANDBOOK LIAISON (Bryan Holcomb)**
 - 2.1. TBD
3. **NEW BUSINESS**
 - 3.1. The next deliverable for TC1.4 is the editing of Applications Chapter 47 Design and Application of Controls. **James Del Monaco**
 - 3.2. HB edits approved and sent to liaison by March 1, 2018.
 - 3.3. 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 and Microsoft Edge are the only compatible browsers. During a test run, several users had issues logging in.
 - 3.4. Recommend using schematics and sequence language from GP36 to be used in Chapter 47.
 - 3.5. Revised section on single-zone systems to be focused on VAV in lieu of constant volume.
 - 3.6. Addresses the control of fan arrays.
 - 3.7. Steve Taylor provided CAD drawings of the GPC 36 schematics.
 - 3.8. Marcelo began and ended at the start of cooling systems.
 - 3.9. Chad edited the cooling systems section.
 - 3.10. James started on Air Systems and proceeded until Constant Volume (CV) Systems.
 - 3.11. Jacky started at CV systems and worked up until Humidity Control. Removed VVT system.
 - 3.12. Barry started at Humidity control and worked up until Special Design Considerations.
 - 3.13. James edited from Special Design Considerations until the end of the Chapter.
 - 3.14. Chariti will review for editorial changes only after the Winter Conference.
4. **NEXT MEETING AND SCHEDULE**
 - 4.1. 4:30-6:30 Monday June 25, 2018 Annual meeting in Houston, TX.
5. **Adjourn**

Adjourn at 6:30

TC 1.4 Handbook Subcommittee Attendance List

Present	Name	
X	James Del Monaco	
X	Barry Bridges	
	Chariti Young	
	Dave Kahn	
	Chad Moore	
X	Marcelo Acosta	
X	Jacky Ly	
Liaisons		
	Bryan Holcomb	Applications Handbook Liaison
	Bob Walker	Liaison from TC 6.1 Valves
	Bass Abushakara	Fundamentals Handbook Liaison