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**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. 06.10 DATE 11/30/18

TC/TG/MTG/TRG TITLE Fuels and Combustion

DATE OF MEETING 6/26/18 LOCATION Houston, TX

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Cory Weiss	2017	Diane Jakobs	2015	Kyle Gluesenkamp
Larry Brand	2015	Paul Sohler	2016	John Kim
Tom Butcher	2015			Tim McNulty
Craig Grider	2015			Thomas Neill
William Roy	2015			Marc Neufcourt
Aykut Yilmaz	2015			Keith Page
				Chris Pickens
				Kumar Sivagnanam

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

TAC Section Head:	SH6@ashrae.net
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)	See ASHRAE email alias list for needed addresses.
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 6.10

### MINUTES June 26, 2018 Houston, Texas

#### 1. Call to Order

Chair Cory Weiss called the meeting to order on January 23, 2018, at approximately 3:35 pm. Participants were as follows:

##### Voting Members Present

Cory Weiss, Chair  
Larry R. Brand  
Tom Butcher  
Craig Grider  
William Roy  
Aykut Yilmaz

##### Voting Members Not Present

Diane Jakobs  
Paul Sohler

##### Others Present

Kyle Gluesenkamp  
John Kim  
Tim McNulty  
Thomas Neill  
Marc Neufcourt  
Keith Page  
Chris Pickens  
Kumar Sivagnanam

#### 2. ASHRAE Code of Ethics Commitment

The chair reviewed the ASHRAE Code of Ethics.

#### 3. Introduction of Attendees

Members and guests introduced themselves.

#### 4. Sign-in and Quorum Determination

Attendees were requested to sign in (attached as Exhibit 1). The quorum requirement was met with 5 of 8 voting members in attendance.

#### 5. Review and approval of the Houston Agenda

Chair Cory Weiss reviewed the Agenda.

Upon a motion, duly seconded, the committee voted to approve the agenda as distributed.

**MOTION PASSED.** 5-0-0-3-CV.

*These draft minutes have not been approved and are not the official, approved record until approved by this committee.*

## 6. Review and approval of the Chicago Minutes

Upon a motion, duly seconded, the committee voted to approve the Chicago minutes as distributed.

**MOTION PASSED.** 5-0-0-3-CV.

## 7. Liaison Reports

### A. Research (Omar Abdelaziz)

Mr. Abdelaziz reported that Research Topic Acceptance Request (RTAR) 1843 was approved, and a work statement is due by March 15, 2020. Chair Weiss noted that TC 6.6 is a co-sponsor of the RTAR, so the committees will plan to work together to develop the work statement. Mr. Abdelaziz also reported on items from the research breakfast, including the process for RTAR and work statement approvals, grant and award updates, trainings for project evaluation and management subcommittees, and abstract policy.

### B. TAC (Dawen Lu)

Section 6 Head Dawen Lu reminded members to not use ASHRAE letterhead unless it is for ASHRAE-approved and sanctioned business.

## 8. Handbook

Chair Weiss reported for Handbook Subcommittee Chair Michael Beisheim. The TC has most recently been working on Chapter 35. It is not clear where Chapter 31 stands, but the committee will need to start thinking about Chapter 28, whose revision is likely to start at the Atlanta meeting. The goal is to finish revisions by February 1, 2019, so that it can have TC approval by June 2019 meeting.

Chair Weiss reported that ASHRAE had received an inquiry about Equation 2 in Chapter 35, and he complimented Mr. Beisheim on his quick response.

Mr. Tim McNulty remarked that the subcommittee is awaiting TC review of Chapter 35. He noted the chapter lacks content on venting requirements for mechanical draft and opined that the chapter should acknowledge that fact. Chair Weiss suggested meeting next month to finalize Chapter 35 and start looking at Chapter 31. The committee also discussed Beisheim's suggestion for a more comprehensive duct heat loss equation.

## 9. Research

Bill Roy reported and commented on next steps for developing a work statement for RTAR-1843. A member noted that AHRI is seeking contractors who could conduct a review of common venting requirements for positive pressure appliances. Mr. McNulty reported he is also working on a new research topic.

## 10. Web Site

Mr. Chris Pickens reviewed the latest status of the TC 6.10 website. A member suggested updating the Functions page, and Mr. Pickens agreed to review what is editable.

## 11. Programs

Chair Weiss reviewed the outcome of the program on venting. It was well attended. He also reviewed the outcome of the Chicago program on biomass. It scored a 4.685. Finally, he reviewed the program tracks for Atlanta and Kansas City.

Mr. Tom Butcher reported on a paper he presented on the use of renewable-fuel heat pumps.

The committee discussed ideas for programs and agreed to:

- Develop a renewable combustion fuels seminar focusing on solid, liquid, and gas fuels.
  - o Ideas for speakers included staff from the Hearth, Patio, and Barbeque Association, the Pellet Fuel Institute, the Biomass Thermal Energy Council, and the Biomass Energy Resource Center.
- Pitch to TC 6.1 a seminar on ASHRAE/AHRI 155P.

**ACTION:** Chair Weiss to contact the TC 6.1 Chair to gauge interest in co-sponsorship. Mr. Butcher agreed to email Chair Weiss a summary of topics.

## 12. Standards

Chair Weiss reported that he received an email from the TC 1.4 (controls and applications) chair suggesting a new guideline or expansion of Guideline 36 to go into sequence of operations. It also suggested multiple programs and research on the topic. Chair Weiss agreed to distribute the correspondence with the minutes (see [Exhibit 2](#)). There was not much discussion on the topic, but members agreed to review it.

Chair Weiss reported that he received a request from Mr. Jim Lutz regarding SPC 41.13, which is developing a measurement standard for fuel heating value, and asked for prospective candidates. Committee members agreed to recommend Mr. Craig Grider.

Mr. Grider reported on several ASHRAE standards activities of interest to the committee:

- SPC 118.1 did not meet because it is anticipating release of a draft for publication public review (PPR).
- SPC 155P is reviewing PPR comments and is about halfway done. It will meet again on July 25.
- SPC 204 is aiming to issue a PPR draft by August.
- SPC 118.2 is addressing comments received and is intending to release a second PPR draft as soon as possible.
- SPC 124 is continuing working on new methods of test to determine combined appliance performance and meets Tuesday mornings.
- SPC 40 has been formed to review the standard for absorption heat pumps.

- SSPC 90.1 is considering a proposal that would require gas hot water boiler systems in new construction to have condensing level efficiencies.

### 13. Membership

Chair Weiss reported that Jeromy Snyder and Kyle Gluesenkamp joined the committee as Provisional Corresponding Members. Chair Weiss agreed to make the next meeting available by web meeting. He added that non-attendees may be purged from the roster. Mr. McNulty expressed an interest in becoming a voting member.

### 14. Old Business

There was no old business.

### 15. New Business

#### Micro-seminar

The committee discussed a proposal from Mr. Butcher to develop a micro-seminar for the next TC meeting, but it did not reach an agreement to do so.

#### Handbook Meetings

At Chair Weiss's suggestion, the committee discussed changing the Handbook Subcommittee meeting to a Handbook, Programs, and Research Meeting.

Upon a motion, duly seconded, the committee voted to change the Handbook meeting to a Handbook, Programs, and Research meeting.

**MOTION PASSED. 5-0-0-3-CV.**

### 16. Next Meeting

The committee will meet at the ASHRAE 2019 Winter Conference, January 15, 2018, in Atlanta, Ga.

### 17. Adjournment

The meeting was adjourned at approximately 6:00 p.m.

Respectfully Submitted,

Aykut Yilmaz  
Secretary

EXHIBIT 1 – SIGN-IN SHEET



Shaping Tomorrow's  
Built Environment Today

### TC Sign-in Sheet

Meeting Info: TC 6.10

Date: 6/26/18

Name	Affiliation	E-mail	Member (Voting, Corresponding, or Guest?)	YEA Member? (Yes/No)
CORY WEISS	FIELD CONTROLS	CWEISS@FIELDCONTROLS.COM	VOTING	NO
THOMAS NEILL	MESTEK	tneill@mestek.com	CORRESPONDING	NO
Craig Grider	Intertek	craig.grider@intertek.com	Voting	No
LARRY BRAND	FRONTIER ENERGY	lbrand@frontierenergy.com	Voting	No
Tom Butcher	Brookhaven Lab	butcher@bnl.gov	Voting	NO
Keith Page	SelKirk/Heatfab	pageke@selkirkcorp.com	Guest	No.
Tim McNulty	KM Monit/d Group	tm@usdrattco.com	CM	
John Kim	Chimney Design Solution	JK@Chimney.net	<del>CM</del> Prov.	
KUMAR SIVAGNANAM	NORCOLD, INC	ksivagnanam@norcold.com	CM	No
Kyle Gluesenkamp	ORNL	gluesenkampk@ornl.gov	Prov. CM	No



EXHIBIT 2 – EMAIL FROM TC 1.4 CHAIR TO CORY WEISS

## Cory Weiss

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**From:** Acosta, Marcelo [SAA] <macosta@armstrongfluidtechnology.com>  
**Sent:** Sunday, June 10, 2018 6:58 PM  
**To:** tc0610@ashrae.net  
**Subject:** ASHRAE Discussion Topic for Houston - A Catalog of Subsystems

Hi Cory,

TC-1.4 *Control Fundamentals and Applications* has presented to TAC the below proposal for a scope addition to the Guideline 36 *High Efficiency Sequences of Operations for HVAC Systems*, whose first edition is being published this month.

The idea, laid out in the 2-page bulletin below, is also including the mechanical design of the systems to which the sequences apply, thus creating a catalog of clearly defined subsystems which can be connected like Lego™ blocks to quickly create thoroughly designed and pretested full HVAC designs.

This initiative will require an amount of effort similar to Standard 90.1 or Standard 189.1, involving multiple disciplines and multiple research projects.

Note the attachment was intentionally kept to 2 pages to give a general concept overview that can be discussed without delving too much into the details.

Please consider including this topic in your TC agenda for discussion in Houston.

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## PROPOSAL FOR NEW SPECIAL PUBLICATION

### Summary

TC-1.4 proposes the creation of an extension of Guideline 36 (or if not possible, a new Guideline), to provide detailed descriptions of the subsystems for which Guideline 36 provides sequences of operations.

TC-1.4 believes this would help

- increase the probability of systems being built, being operated, and perform as designed
- increase the HVAC systems reliability
- reduce design complexity, allowing to produce thorough designs in the same billable hours
- reduce the design cost and risk of complex strategies, such as automatic fault detection and diagnostics for systems, therefore allowing for their widespread use
- accelerate and simplify the adoption of new technologies, by integrating them into these subsystems.

### BACKGROUND

TC-1.4 has organized surveys and brainstorming sessions during subcommittee meetings and program sessions to tackle the **poor energy performance and reliability of HVAC systems**, as well as the **slow adoption of new technologies** that would help solve them. In those sessions, members expressed their **concern for the energy waste and environmental impact of the HVAC systems**.

They also expressed their misgivings about most new technologies, as they tend to be complex and misunderstood, so when included in designs, they tend to not be implemented and operated as they should. This was confirmed by building surveys by [PNNL](#) and [Berkeley Lab](#): a few years after

commissioning, most buildings with new designs don't perform as expected, but similarly to buildings designed 30 years ago.

Also, the fact that current designs use equipment as basic building blocks, and the short design time available, limits the complexity and thoroughness possible in HVAC designs. All this causes the widespread practice of replicating old and less efficient, but simpler and time-tested designs.

More efficient designs being usually more complex, and needing more fine tuning, require more details, and better understanding by all parties involved throughout the system life.

In short, the emerging consensus is that efficient designs and technologies would be gladly adopted if they were

- reliable and pretested
- as plug-and-play as possible
- easy to incorporate in designs
- easily understood by all parties
- auto-detecting performance and operation deviations, and if possible, self-correcting.

Guideline 36, a compilation of High Performance Sequences of Operation for HVAC Systems, is a first step towards a solution.

As Guideline 36 came out for public review in 2017, and before formal publication, some ASHRAE members started using it and soon questions came to GPC-36 and TC-1.4 requesting descriptions and specifications of the systems they applied to.

Specifically, we received enquiries about sensor locations, type, and accuracy; minimum equipment technology and how variations (e.g. the presence of a desiccant wheel) would change the controls; how these subsystems would interact with other subsystems (e.g. chiller plant, boiler plant, and air handlers); and what subsystems would be compatible with others while maintaining the proposed reliability and efficiency.

## PROPOSAL DETAILS

A solution to the problems and limitations listed above is having a set of well defined, tested, and efficient subsystems, or "macroblocks", to be used as the basic building blocks of HVAC designs.

ASHRAE can provide a **compilation of macroblock designs** in a guideline, which would be referenced in HVAC designs. E.g. "The chiller plant shall be ASHRAE Guideline XX, subsystem 26, with options A, D, and E, sized for 850 Tons"

Each subsystem specification should at least include:

- Minimum requirement specifications for all the equipment, including accessories (e.g. valves, water treatment, strainers)
- Equipment connection diagram (P&ID), with all accessories, sensors location, and ducts and piping sizing guidelines (or pointers to those guidelines).
- Controls equipment minimum specifications, detailed sequences of operations (or pointers to sections of Guideline 36)
- Options (e.g. optional geothermal field in parallel with cooling towers)
- All interfaces required for interactions with other subsystems, from piping connection ports, to network points, and related functions (e.g. how the boiler plant will use the load valves)

position to optimize the supply temperature and distribution pumps speed), to make them as plug-and-play as possible.

- All sensors and routines required for automatic fault detection, diagnostics, and ongoing commissioning.

They may also include:

- EnergyPlus model which can take the models of the specific equipment used.
- Commissioning and maintenance recommendations.
- Sensors and logic to verify the equipment performance. This should be accompanied with a requirement for equipment suppliers to provide an efficiency map at the time of submittal, which will be part of what's covered by their warranty, as well as the "as-built" efficiency map measured before shipping.

Before inclusion in the guideline, samples of these subsystems should be built, tested, and improved via ASHRAE research projects, potentially with co-sponsors, satisfying the "pretested" need.

The incorporation of new technologies into these thoroughly designed, pretested, and almost plug-and-play macroblocks would make their adoption significantly easier and faster.

As the development of these specifications should involve expertise from most ASHRAE technical groups, we request this proposal is forwarded to all ASHRAE groups chairs for discussion. We'll be looking forward to their feedback.

On behalf of TC-1.4,

Marcelo Acosta  
TC-1.4 Chair

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Notes – In the preliminary discussions by TC-1.4 the following comments and concerns came up:

- 1- Would this eliminate the need for HVAC designers?  
A: We had in our meetings representatives from UK and Denmark, which use similar approaches and who reported no HVAC designer jobs were lost. Instead, the designers in these countries have become able to provide much more detailed and reliable designs in the same budgeted hours.
- 2- Each building is different, so trying to come up with a one-size-fits-all is impractical and utopia.  
A: The idea is not to have one design that covers everything, but many reliable subsystems that can be combined in different ways to cover the needs of most buildings. This is already common practice for rooftops and chillers: we don't design them, we just select the standard design that best fits our project needs.
- 3- But every building offers unique opportunities that standard designs can seize.  
The gist of the idea is having solid, standard, pretested, well know, and robust designs which benefit from an economy of scale. While custom designs may promise lower cost and additional efficiency due to a building unique opportunities, the same uniqueness brings the "one-of-a-kind", "untested", and "not well understood" factors that make most buildings perform worse than their design intent.
- 4- What about compliance with different local codes and different climate zone needs?  
A: As explained above, the idea is defining many standard subsystems, but not a huge amount. There would be variations based on climate zone and ideally the standard would comply with the most stringent codes. Eventually the codes would adjust to what's possible and become more uniform.

- 5- So, what would ASHRAE be responsible for? What would be in this standard?  
ASHRAE would define these subsystems and how they interact with others, then create minimal performance specifications for them. Each subsystem will be prototyped and tested via research projects.

Once again, Cory, please consider including this topic in your TC agenda for discussion in Houston.

Regards,  
**Marcelo Acosta**  
ASHRAE TC-1.4 Chair  
Manager, Controls Engineering  
Armstrong Fluid Technology

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