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# 1791 Tullie Circle, N.E./Atlanta, GA 30329

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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. 2.2 DATE January 14, 2019

TC/TG/MTG/TRG TITLE Plant and Animal Environments

DATE OF MEETING January 14, 2019 LOCATION Atlanta, GA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| MEMBERS PRESENT | YEAR APPTD | MEMBERS ABSENT | YEAR APPTD | EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE | |
| Morgan Hayes, Chair VM | 2016 | Andres Alfonso Rojas | 2018 | Bert Phillips Sect head | |
| Nadia Sabeh, Vice Chair VM | 2016 | Larry Howlett VM | 2016 | Kyle Bowling CM | |
| Craig Burg VM | 2017 | Lingying Zhao CM | 2012 | Kevin Muldoon CM | |
| Joe Zulovich (e) VM | 2014 | Kristin Schaefer CM | 2013 | Danielle Monfet CM | |
| Bill Dean Past Chair CM | 2016 | Yuanhui Zhang CM | 2011 | Morgan Hayes | |
| Jim Coogan VM | 2016 | Marcus Bianchi CM | 2012 | Joe Zulovich | |
|  |  | Andres Alfonso Rojas CM | 2017 | Peter Luttik | |
|  |  | Brian Dunn CM |  | Ryan MacGillivray | |
|  |  | Dave Rausch Chair VM | 2016 | Scott Grefsheim | |
|  |  | Mark Baines CM |  | Eric Sturm | |
|  |  | Chris Albright CM |  | Michael Calabrese | |
|  |  | Carol Donovan CM | 2012 | Alekhya Kaidnathbhatta | |
|  |  | Henry Hays VM | 2014 | Craig Burg | |
|  |  | Xinlei Wang CM | 2012 | Darrin Drollinger (Exec Dir. ASABE) | |
|  |  | Adam Davis CM | 2018 | Jeff Clarke | |
|  |  |  |  | Dan Dettmers | |
|  |  |  |  | Mustafa Morsy | |
|  |  |  |  | Scott Dorsett | |
|  |  |  |  | Steven Fordyce | |
|  |  |  |  | Megan Oaklief | |
|  |  |  |  | Adam Michalson | |
|  |  |  |  | Laura Merchak | |
|  |  |  |  | Niss Feiner | |
|  |  |  |  | Tony Rossi | |
|  |  |  |  | Andres Alfonso | |
|  |  |  |  | Rob Bedard | |
|  |  |  |  | Bill Dean | |
|  |  |  |  | Jim Coogan | |
| **DISTRIBUTION: *All Members of TC/TG/MTG/TRG plus the following:*** | | | | | |
| TAC Section Head: Elbert Phillips | | | | SH2@ashrae.net | |
| All Committee Liaisons As Shown On TC Roster   * Research Liaison * Standard Liaison * Staff Liaison * 2019 HVAC Applications | | | | Pawel Wargocki  Cyrus Nasseri  Michael Vaughn  Bryan Holcomb | |
| Mike Vaughn,  Manager Of Research & Technical Services | | | | MORTS@ashrae.net | |

**Technical Committee 2.2 Plant and Animal Environment January 14, 2019**

# Call to Order

Meeting called to order at 4:24 CST by Chairman Morgan Hayes

# Welcome and Introduction / Attendance Sheet

All in attendance introduced themselves and signed in. A total of 29 persons in attendance.

Darrin Drollinger, Executive Director of ASABE in attendance as special guest to Jeff Clarke.

Quorum: 5 of 8 voting members in attendance. (Note: only 4 voting members originally in attendance, which is reflected by vote for Agenda and Minutes approval)

One attendee using the e-meeting

# Revise and Accept Agenda

Agenda reviewed.

Motion: To accept the agenda.

Moved: Nadia Sabeh Seconded: Craig Burg; **Approved 4 – 0 – 0 CV**

# Approve Minutes from the Previous Meeting

Minutes reviewed all was considered acceptable..

Motion: That the January 2018 minutes be adopted with the modified call to order time.

# Moved: Joe Zulovich Seconded: Craig Burg ; Approved 4 – 0 – 0 CV

# Report from Section Head

Bert Phillips introduced ASHRAE’s desire to reduce the number of TCs. Are we interested in absorbing or being absorbed by another TC.

Nadia: It is the opinion of this TC that we shouldn’t be absorbed by another TC, nor absorb a TC. Our TC is very specialized with unique focus and expertise that is highly sought after in the Society.

# Announcements

* Remote meetings via GoToMeetings, which is the ASHRAE system. And it works well.
* Seminar and Forum Proposals for Kansas City Meeting are due February 6th – Carol Donovan to submit.
* TC9.8 is submitting an MTG to coalesce all interested TCs into a
* Nadia Sabeh – To update and submit Meeting Minutes by 2/25
* Morgan Hayes – To Send Meeting Reminder by 5/22
* Next ASHRAE Conference – Kansas City – June 22nd to June 26th
* 2020 ASHRAE Winter Conference – Orlando – Feb 1st to Jan 5th
* 2020 ASHRAE Summer Conference – Austin, TX

# Roster & Status of the committee

The committee is growing and the energy level to some of the topics (indoor plant production) is growing. We updated our corresponding and voting members.

There are some people on roster who signed up in 1990 and may need to be removed from list.

Action: Morgan will contact “legacy” members to make sure they are still interested in being a member. If they are still interested in being a member, please respond. If response, then keep. If bounces back, remove. If no response in 2 months, remove. (This is ASHRAE’s procedure.)

*New Positions following Atlanta meeting***;**

* No new positions

# Handbook – Nadia Sabeh

No updates were made to current Applications Handbook Chapter.

There used to be a Chapter in the Fundamentals Handbook

We can submit updates and edits at any time and they will be incorporated into the electronic version.

Historically (15-20 years ago) there was a sister technical committee in ASABE. (Darrin Drollinger)

Many of those members retired and updates have not been made. (Joe Zulovich)

What drives the data and design methodology that we have for animal environments? Is it productivity? What are the ethical implications? (Nissun Feiner)

* Morgan: We want to protect the animals from heat stress, which will also help with productivity. Ventilation rates recommended to remove heat.
* Joe: Worker health issues. Conditions provided via ventilation in swine facilities really targeted for worker safety and health. Manure handling to make indoor quality acceptable. Animal well-being is part of the design process
* Nadia: plant well-being drives design for indoor plant environments. But the design criteria can bump up against human health, especially in the case of CO2.

The ASABE standard (discussed below) should provide groundwork for the additions needed to the handbook chapter.

Motion: That the handbook be approved as is for this edit period.

# Moved: Bill Dean Seconded Jim Coogan Approved 5 – 0 – 0 CV

# Research – David Rausch

No updates from the research liaison. There is a paragraph to start development of the RTAR, but more details will be needed.

1. Energy Use in Agricultural Buildings: Dave Rausch to champion Nadia Sabeh and Craig Burg to assist along with Peter Lultik and Joe Zulovich and Danielle Monfet.

A draft was developed and prepared for submission. The team agreed that the RTAR should be split into three (3) specific objectives that help the Society improve understanding of energy use in Plant Production Rooms.

* RTAR 1: Establish metrics for understanding energy use in indoor plant environments
* RTAR 2: Study energy use in indoor plant environments
* RTAR 3: Evaluate the use and impacts of energy conservation measures.
* Need to check the status of the proposed RTAR last summer. Was it submitted? If not, it is basically ready for submission this Spring with minor modifications/additions.

Morgan will check with Dave Rausch to find out if RTAR 1 was submitted. If it was not, then we will prepare to submit it in February.

1. Horse barn and arenas ventilation and dust suppression using water

Proposed by Morgan Hayes, Joe Zulovich may help champion

Indoor horse barns are becoming more prevalent. Without proper ventilation, there is concern that moisture will build up, increasing health risks for horses and condensation forming on interior surfaces of building.

Questions to resolve: How much ventilation? How to use it effectively?

What ventilation is effective at controlling moisture, heat stress, and particulate matter? We have a very large moisture load, but maybe no heat load.

Possible collaboration with TC1.12 (moisture management)

# Programs – Carol Donovan (Absent)

Discussion led by Morgan Hayes and Nadia Sabeh

What are the biggest topics of interest for Society members?

What Technical sessions to propose?

Would a forum to be an effective platform for this topic?

Should we propose a Track of sessions? If we do, the earliest meeting to propose a track is Summer 2020 in Austin.

Program Topics Proposed:

Technical Track:

1. Plant Physiology
2. Cannabis
3. Urban Farming
4. Energy Use Implications
5. Standards, Utilities, Regulators, Governing Agencies
6. AHJs, Farmers, Engineers (Round Table Discussion)
7. Design for harsh environments (northern Quebec, McMurdo Station, MELISSA Mars, NASA, very hot/very humid climates) – An interesting round table (Nissun)
8. Food Security, Food Storage, and Food Transportation

Plant Physiology Seminar

What track would a Plant Physiology seminar fall under?

* Fundamentals and Applications

Moisture production by plants

Energy vs. plant productivity

Understanding the entire system and the room

People are salivating for real, practical information

Psychrometrics

Does this topic need to be paired with something else to be accepted?

Clever enough title and abstract for a Plant Physiology seminar to get accepted.

* Include food security
* Plants are not humans

Proposed Session for Summer 2019 (Kansas City, MO)

Systems Approach to Indoor Plant Environments

* Room = Control Volume
* Plant = Control Variable
* Equipment = Control Mechanism

Program Acceptance Rates

Seminars: 83% Acceptance

Forums: 20%

# Old Business

None.

**ASABE/ASHRAE Standard X653**

HVAC for Indoor Plant Production without sunlight.

This standard is being co-developed by ASABE and ASHRAE.

Yesterday (1/13/2019) the X653 drafting committee held an in-person meeting and writing workshop from 9am-4pm. A total 15 people participated in drafting the dehumidification and cooling sections of the Standard.

There are currently 56 observing and voting members in the X653 committee. More will be added following yesterday and today’s meeting.

The next in-person meeting is planned for July 7th at the Annual ASABE conference in Boston, MA.

All ASABE standards are voluntary standards. It is very broad and representative of the society. Some have been picked up for codes and regulations, but ASABE is neutral and agnostic. There is no certification process, provides no direction over what should or should not be done. By ASABE standards, X653 will be a Guideline.

Question:

Could the Standard be published before the Austin meeting? That would go very well with establishing an indoor ag track.

ANSI approval process and timeline can be very unpredictable. If a large body of research is referenced, it can be easier to get approved.

Even if not completed, we can still inform session attendees about the development of the standard and an update on its publication.

# New Business

MTG – ASHRAE Indoor Plant Production Facility Design, Systems, and Equipment

Developed and sponsored by TC9.8

When first concepted, it was to be cannabis focused. TAC asked 9.8 to open it up to other crops and environments. 9.8 agreed that this is the way forward. Indoor only, no sunlight.

Title: ASHRAE Indoor Agricultural Facility Design, Systems, and Equipment

* TC 2.2 recommends changing name:
* Indoor Plant Production
* Add “no natural light”
* Should we focus on “no natural light”? What about
* What are we trying to scope out? Do we want it to focus on a narrow scope? Should we exclude greenhouses and natural light?
* MTG: there is one voting member from each TC, plus one alternate member. Makes sure all TC interests and voices are heard
* The advantage is that the other TCs have a perspective that is different. The MTG brings all those perspectives together to bring an integrative view together.
* MTG is a multidisciplinary task group that comes together to bring all expertise and interests together
* MTG can help prevent overlap. It’s a harmonizing body so that everyone knows what’s going on.
* Kevin put together and submitted the MTG application
* Kevin Muldoon = Chair, Vice-Chair = Scott Peach, Craig Burg = Voting Member from TC2.2
* ASABE = Affiliation with Nadia as voting member from ASABE
* Joe moves that Craig is TC2.2 voting member, Nadia = ASABE voting member
* Kyle moves that Nadia is a voting member.
* Morgan seconds Joe’s motion
  + Motion passes
* PAFS-30 has to approve that Nadia is a voting member affiliation from ASABE
  + Nadia will ask for approval during annual ASABE meeting
* Nadia moves that Kyle Bowling is the alternative TC2.2 voting member.
  + Motion passes

Scope:

## MTG.#### will coordinate TC/TG/TRG technical activities related to the design of indoor plant production facilities and their HVAC systems. The priority of the MTG will be coordinating communication and opportunities between and through each of the involved committees to align and provide an ASHRAE society stance and direction for the development of plant production facilities. There is an ASABE standard in development, X653, which focuses on environmental conditions for indoor plant production facilities. This ASHRAE MTG will help guide designers, engineers and owners on how to best design and select the HVAC systems and equipment given the conditions in that standard. The MTG would ensure that aspects related to energy efficiency, efficacy, and selection of optimum HVAC systems are well understood within ASHRAE.

We agreed to submit the MTG with representation from many other TCs.

Special Publication? (Bill Dean)

There’s a strong demand that the people around these tables either know or want to know, and there is a demand for it now, not a year-and-a-half from now. Can we create a special publication that addresses these seminars that is available to anyone? Would help the handbook chapters get developed. Cold Climate Design Guide: Each chapter written by different author, and one editor.

Joe Zulovich – What if we did a series of webinars so that at least orally the information has been presented.

Alekhya - What if we publish each of these topics in sequential ASHRAE journals?

Attendees agreed to wait until X653 was further developed.

# Adjourn

Motion: Adjourn at 6:21

# Moved: Morgan Hayes Seconded: Craig Burg; Approved 5 – 0 – 0 CV

Minutes submitted by Nadia Sabeh