



180 Technology Parkway N.W./Peachtree Corners, GA 30092  
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. 6.1 DATE June 28, 2022

TC/TG/MTG/TRG TITLE Hydronic and Steam Equipment and Systems

DATE OF MEETING June 28, 2022 LOCATION Hybrid (Toronto, ON Canada)

| MEMBERS PRESENT  | YEAR APPTD | MEMBERS ABSENT         | YEAR APPTD | EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE |
|------------------|------------|------------------------|------------|--|
| Bob Walker       | 2022       | Viral Dharaiya         | 2019       | Jack Kibort                                  |
| Jessica Mangler  | 2019       | Niels Bidstrup (Non-Q) | 2020       | Julia Keen                                   |
| Jennifer Leach   | 2019       | Stan Kutin             |            | Mick Schwedler                               |
| Frank Meyers     | 2021       | Mike Trantham          |            | Tom Cappellin                                |
| Steve Tredinnick | 2019       |                        |            | Jason Atkisson                               |
|                  |            |                        |            | Scott Fisher                                 |
|                  |            |                        |            | Robert Bean                                  |
|                  |            |                        |            | David Lee                                    |
|                  |            |                        |            | Rex Scare                                    |
|                  |            |                        |            | Kevin Summers                                |
|                  |            |                        |            | Patrick Villaume                             |
|                  |            |                        |            | Nick Chui                                    |
|                  |            |                        |            | Mehdi Doura                                  |
|                  |            |                        |            | Julia Keen                                   |
|                  |            |                        |            | Panos Fykas                                  |
|                  |            |                        |            | Steve Wortman                                |

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

|   |  |
|---|--|
| TAC Section Head:   | Doug Reindl  |
| All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.) | Chapter Tech. Transfer – Elizabeth M. Zakelj<br>Research – Stefan Elbel<br>2024 HB Systems – Derek Crowe (Chs 11, 28, 32, 36, 44, 46); Satish Iyengar (Chs 13, 14, 15); Ahmed Medhat (Chs 47 and new ChW Plant)<br>2021 HB Fundamentals – Stephanie Mages<br>Standards – Craig Wray<br>Staff – Steven Hammerling |
| Mike Vaughn,<br>Manager Of Research & Technical Services                                  | <a href="mailto:MORTS@ashrae.net">MORTS@ashrae.net</a>   |

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

**1. Call to Order:**

Chair Walker called the meeting to order at 1:09 pm. Chair Walker apologized for the late start of the meeting due to technical difficulties in obtaining wireless signal for virtual meeting. Chair Walker welcomed all in attendance and self-introductions were made and stated it was good to see people in person. Attendance was gathered through the list of participants and the chat window. A roll call of voting members was conducted, and a quorum was present with 5 of 8 voting members.

Technical Committee 6.1 is concerned with all aspects of hydronic and steam systems. This includes the application of boilers, chillers, terminal units, and all accessories and controls making up the total system as well as the design of the integrated system. In addition to comfort applications of both heating and cooling, snow melting systems are included. Cooperation with other TCs is recognized in areas such as control, noise and vibration, refrigeration, pumps and hydronic and service water piping.

Chair Walker read 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 at [www.ashrae.org/about-ashrae/ashrae-code-of-ethics](http://www.ashrae.org/about-ashrae/ashrae-code-of-ethics))

**2. Setting of the Agenda:**

The Chair passed out an updated Agenda. Agenda was posted to the TC webpage. Motion by Jessica Mangler second by Jennifer Leach. Motion passed 4-0-1 There were no objections to the Agenda.

**3. Approval of Las Vegas 2022 Meeting Minutes:**

Motion by Jessica Mangler and Second by Frank Meyers. Motion passed 4-0-1.

#### 4. Recognition of Liaisons:

None present.

#### 5. Chair's Report

Chair Walker summarized the key items from the Section 6 Breakfast Meeting.

- There was a request from Chair Walker several months ago for technical reviewers of an article. Chair Walker wanted to extend his thanks for the overwhelming number of volunteers!
- It is ASHRAE's intent to conduct Hybrid Meetings in the future. Chair Walker desires to have sub-committees in person starting at the Atlanta meeting due to reduced participation for past virtual meetings.
- There is a desire to keep the balance of voting members on the TC. Requirements are now that you must be a full ASHRAE member to be voting member or Chair or Vice-Chair.
- Technical Activities Committee (TAC) Open Mike Policy. TAC traditionally meets the Saturday before the winter and summer society meetings start and the Wednesday at the conclusion of the conferences. TAC is starting an "Open Mic" to allow membership to have a voice to express their concerns and offer improvements. It is appreciated if you send a formal request to [ASKTAC@ashrae.net](mailto:ASKTAC@ashrae.net) to be recognized to speak.
- A new form will be added to submit motions to TAC for consideration on [www.ashrae.org/TCs](http://www.ashrae.org/TCs) and Basecamp.
- TC Re-Org Update
  - TAC has finished their work to re-organize TCs but TCs can continue to work towards effort of streamlining and improving efficiency.
  - So far, TAC has numerous TC mergers – 3.2 & 3.3, 8.10 & 8.12, 9.4 & 9.8, 7.3 & 7.8, 10.5 & 10.8 & 10.2, and 10.1 & 10.3. More (8.9 & 10.7) are in the works.
- ASHRAE is meeting next in Atlanta, GA, USA, Feb 4-8, 2023. Seminar and Forum proposals are due by Tuesday, August 9, 2022. See: [www.ashrae.org/conferences/2023-winter-conference-atlanta](http://www.ashrae.org/conferences/2023-winter-conference-atlanta)
- 2021-2022 Hightower Award Nominations by Thursday, September 1, 2022.
  - There were 4 nominations for last year's award. Thanks to all TCs that nominated! All that did not win are encouraged to resubmit.
  - TAC wishes to encourage TCs to make nominations for the 2022-2023 George B. Hightower Technical Achievement Award. Nominations are due to Section Heads by September 1, 2022 or sooner.
  - The award recognizes outstanding technical leadership and contributions on a TC/TG/TRG during the past four years, excluding research and standards activities. Please go to the Technical Committee page of the ASHRAE website at the following link under the "Procedures, Forms..." heading: [www.ashrae.org/tcs](http://www.ashrae.org/tcs).
- 22-23 Roster Rollover. Remember, the current 2021-2022 roster for your TC, TG or MTG is in effect until after they meet for the ASHRAE Annual Conference. Rosters will roll over to 2022-2023 at that point.
- Conferences and Expositions Committee's (CEC) Standing Request for Future Society Meeting Program Track Suggestions

- The Conferences and Expositions Committee (CEC) oversees ASHRAE’s annual and winter conferences and other specialty conferences and expositions globally. The CEC continually works to improve the conference experience for all attendees. To help keep a “pulse” on the technical issues facing professionals in the HVAC&R marketplace, and to create meetings that reach all of ASHRAE’s constituencies, the CEC seeks ideas for tracks for the 2023 meeting conferences as well as topics for specialty conferences from TC members.
- Please submit your suggestions to ASHRAE Staff member Tony Giometti (Giometti@ashrae.org). You can also add your track suggestion in the “Comment” section of the TC Activity form for the Toronto or Atlanta meetings.
- CEC Always Seeks TC Volunteers willing to Support Content Development and Quality Control for Society Technical Program at Society Meetings.
- The Professional Development Committee (PDC) is seeking ideas for new ASHRAE Learning Institute (ALI) courses. Contact :Karen Murray (ASHRAE staff) [kmurray@ashrae.org](mailto:kmurray@ashrae.org) or [PDCchair@ashrae.net](mailto:PDCchair@ashrae.net) with your course ideas.
- ASHRAE Certification Committee seeking ideas from TCs for possible professional certification programs.

## 6. Sub-Committee Reports

- Programs: Jennifer Leach (Chair).
  - The sub-committee met virtually on June 20<sup>th</sup> and discussed program opportunities.
  - Toronto had the following programs cosponsored Seminar 2 with TC 6.2: Reimagining the Old, Inventing the New: Tools and Strategies for Decarbonizing Buildings with District HVAC Systems Around the World.
  - Atlanta deadline for programs is August 9th. There is a new system that does not open until July 19th. Program notification are in October 2022
  - Chair Leach summarized the tracks for Atlanta winter meeting:
    - HVAC&R Systems and Equipment; Fundamentals and Applications; Refrigerants and Refrigeration; Pathways to Net Zero Energy and Decarbonization; Operations and Maintenance; Building Simulation and Virtual Design in Construction; Mini Tract - Innovative response to supply chain challenges.
    - Chair Leach would like to have a meeting prior to the August deadline to make sure all programs are clearly identified.
    - There will be no online or virtual presentations anymore.
    - Possible program for Atlanta under Net Zero and Decarbonization track where Jessica can provide a program on laboratory buildings and also speak, but the session would need a chair for the seminar and other speakers for other building types. Mick Schwedler said that he could present a topic as well.
    - Mick Schwedler thought that Decarbonization will be extremely popular and full so a topic that fit in more than one track would have more success in being accepted.
    - Other topics thoughts: How do hydronic systems help you to decarbonize?

- TC 7.2 is doing a supply chain session for contractors and OEMs, installation struggles due to supply chain issues. We could do a possible joint session from a OEM/manufacturers input.
- Bob Bean stated that TC 6.5 is putting together a program on net zero energy multifamily, possible cross pollination opportunity between TCs.
- Jennifer asked if we could resurrect some previous presentations and update them.
  - Represent some past topics with new up to date viewpoint. Julia can could do a basic hydronic session for university students since most engineering schools do not teach hydronics.
  - Jason Atkisson, Julia Keen and Bob Bean volunteered for papers. David Lee volunteered to chair.
- Also, could potentially use the NYSERDA/ASHRAE Webinar Series on Community Energy Systems. Tredinnick cannot attend Atlanta, but he suggested contacting other presenters Lisa Meline and Gary Phetteplace.
- 2023 Annual Conference in Tampa, FL
  - Tracks released today – HVAC&R Systems and Equipment; Fundamentals and Applications; Research Summit; Pathways to Net Zero Energy and Decarbonization; Future-Proofing the Built Environment; Building Automation and Control Systems; Professional Development and Education.
  - Conference and technical papers always get slotted first in the order.
- Research: Ted Duffy (Chair).
  - No report and Sub-Committee Chair not in attendance.
  - Jessica Mangler reported that RP1890 (adequate flushing velocities in hydronic systems) went out for bids. Only one bidder proposed and unfortunately the did not achieve the minimum 80-point score. The RFP will have to rebid. Proposers seem to be extremely swamped now.
- Handbook: Viral Dharaiya (Chair). Not in attendance.
  - Chair Walker summarized the meeting minutes that were held on June 21, 2022, virtually (see attachment). There are no changes to chapter responsibilities from previous meetings.
  - Authoring portal being improved. Chapters uploaded again.
    - Several members could not access their respective chapters. Viral worked with Heather Kennedy on correcting this issue.
  - Scott Fisher stated that Fundamentals 2021 Chapter 22 didn't add all the edits submitted that the TC voted on.
  - Scott also mentioned that as of 2025 the authoring portal will only have PDFs to edit and not word documents. Action: Viral – inquire with HQ if we need to have special software to edits PDFs
  - The meeting was short and was attended by 10 participants.
- Chilled Water Plant: Steve Tredinnick (Chair)
  - Authoring Portal is back up and running.
  - The new chilled water plant design chapter is identified as Chapter 52.

- Unfortunately, the reference folder no longer exists with all the bibliographies, referenced papers and support files.
  - Need to figure out if it is recoverable. Tredinnick put in a request to HQ.
  - Tredinnick plans to spend more time on the chapter late 2022 and early 2023.
- Chair Tredinnick is retiring in early 2023 and is looking for a suitable replacement as sub-committee chair.
- Membership: Jessica Mangler (Vice-Chair duties).
  - Currently there are 8 voting members.
  - Stan Kutin and Mike Trantham are rolling off as voting members. Stan Kutin has retired. Mike had personal reasons and could not attend future meetings. The committee wanted to thank Stan and Mike for their service. Thank you!
  - Rex Scare and Ted Duffy are coming in as voting members.
- Standards: Frank Myers (Chair).
  - SSPC 90.1
    - The 2022 version is now out of the SSPC for expected publication in time for the Atlanta meeting.
    - The mechanical subcommittee is investigating a requirement for oxygen trim on boilers above 5 million Btuh.
    - We understand this change is being processed through IECC for their next edition, so it has been proposed for addition to 90.1.
  - SPC 155P Method of Testing for Rating Commercial Space Heating Boiler Systems
    - SPC 155 previously responded to all commenters to the last ISC public review.
    - They met this Sunday and voted out for public review a good number of relatively small, but important ISCs to the standard.
    - The next step is to respond to those comments when and if there are any. If any substantive changes result from those comments, there will have to be another small ISC public review.

## 7. Task Force for Decarbonization (Chair Jason Atkisson)

- Kent Peterson chaired the Task Force (TF) and had a kickoff meeting earlier in the week.
- Asked for additional funding and received. TF will move rapidly to complete their goals.
- TF will act as a project with several project managers with a 24-month time frame, extremely fast.
- Knowledge hub will be set up to be a collection of information for use— resources, standards,
- There are two (2) Sub-committees – 1) products and service to coordinate with TCs, etc. 2) operational which is made up of multiple working groups and creating content – guides, integration with standards, etc.
- Following this meeting there will be a two-week call coming up by from chair Kent Peterson looking for to Subject Matter Experts (SMEs) to bring expertise for participation and leadership as working group leaders. The TF also needs liaisons from TCs. It is likely that some TCs will have the opportunity to provide multiple liaisons, not just to the TF but to the individual working groups.

- Goal is to have a decarbonization design guide for hospitals and then laboratories published as soon as possible with the information accumulated.

**8. Liaison Reports from other TC's and Organizations.**

- 6.2 District Energy. Nothing to report from Jessica Mangler or Steve Tredinnick.
- 6.5 Radiant Heating and Cooling. Robert volunteered to bring a report in the future.
- 6.6 Service Water Heating. Frank Myers nothing to report.
- 6.7 Solar and Renewable. No liaisons in attendance. No report.
- 6.8 Geothermal heat pump and energy recovery. No liaisons in attendance. No report.
- 6.10 Fuels and Combustion. No liaisons in attendance. No report.
- Residential Building Committee. No liaisons in attendance. No report.
- Hydronic Industry Alliance. No liaisons in attendance. No report.

**9. Old Business:**

None

**10. New Business:**

- TAC desires to still have remote virtual sub-committee meetings prior to the conferences.
- Chair Walker recognized the soon to be retired Steve Tredinnick and thanked him for his service.

**11. Meeting Adjournment:**

- Meeting Adjourned by Chair Walker.

Submitted by,  
Steve Tredinnick  
TC 6.1 Secretary

## **TC 6.1 Handbook Subcommittee Meeting Action Items Virtual on 06/21/2022**

1. Review the List of authors for next cycle on HVAC Systems & Equipment for 2024. No changes to the list.
2. Chapters should be on authoring portal by end of this week, received response from Heather Kennedy.
3. Discussed and decided to have drafts for 2024 publication be ready for approval and voting during Winter 2023 Handbook subcommittee meeting.
4. Email from Jennifer leach – “we have very little direction in the handbooks for applications of heat pumps for building heating. This is something we should tackle moving forward.” Discuss with group.
  - a. May be add a section in Chapter 13. Coordinating efforts with TC 6.8, chapter 9.
5. Updates on CHW Plant Subcommittee. Its not on the Authoring portal yet but will get there soon.
6. Briefly discussed the Authoring Portal key points for access, revisions under track changes, and save any edits to word file.
7. Lead Author for Ch 22 – Pipe Design for Fundamentals publication in 2025. Any volunteers?
  - a. Jennifer Leach, Viral Dharaiya volunteered to lead the review.
8. Attendance – Viral Dharaiya, Jennifer Leach, Bob Walker, Jessica Mangler, Jason Atkisson, David Lee, Steve Tredinnick, Rex Scare, Thomas Neil, Mark Hegberg

| Handbook                 | Year | Ch#                        | Chapter Title  | Lead Authors                            |
|--------------------------|------|----------------------------|--|---|
| HVAC Systems & Equipment | 2024 | 11                         | Steam Systems  | Rex Scare                               |
|                          | 2024 | 13                         | Hydronic Heating and Cooling                         | Mark Hegberg                            |
|                          |      |                            |  | Rick Heiden                             |
|                          |      |                            |  | Jennifer Leach                          |
|                          | 2024 | 14                         | Condenser Water Systems                              | Steve Tredinnick                        |
|                          | 2024 | 15                         | Medium and High Temperature Water Heating            | Belongs to TC 6.2                       |
|                          | 2024 | 28                         | Unit Ventilators, Unit Heaters, and Makeup Air Units | Scott Fisher                            |
|                          | 2024 | 32                         | Boilers  | Ted Duffy                               |
|                          |      |                            |  | Patrick Villaume                        |
|                          | 2024 | 36                         | Hydronic Heat-Distributing Units and Radiators       | Mark Hegberg                            |
|                          | 2024 | 44                         | Centrifugal Pumps                                    | Rick Heiden                             |
|                          |      |                            |  | David Lee                               |
|                          | 2024 | 46                         | Pipes, Tubes, and Fittings                           | Stan Kutin                              |
|                          |      |                            |  | Dropped, added to Ch 22 in Fundamentals |
|                          | 2024 | 46                         | Valves   | Robert (Bob) Walker                     |
| Viral Dharaiya           |      |                            |  |   |
| Mark Hegberg             |      |                            |  |   |
| 2024                     | 47   | Heat Exchangers            | Stan Kutin   |   |
| 2024                     | New  | Chilled Water Plant Design | Steve Tredinnick                                     |   |
|                          |      |                            | Rick Heiden  |   |

Submitted By,  
Viral Dharaiya ([viral.dharaiya@haysfluidcontrols.com](mailto:viral.dharaiya@haysfluidcontrols.com))  
ASHRAE TC 6.1 Subcommittee Handbook Chair