



TC 6.8 Geothermal Heat Pump and Energy Recovery Applications

Full Committee Meetings Minutes

2022 Summer meeting in Toronto, ON, Canada

Conference Room: Sheraton, Linden (M)

T.C. 6.8 2022 Full Committee Meeting Minutes

Tuesday, June 28, 2022

3:30-5:30 PM (Eastern)

Minutes prepared by Vice Chair, Howard Newton (howard.newton@iegmep.com)

Notes:

- Steve Hamstra – Current Chair
- Introductions of Meeting Participants
 - A quorum was established
- Approval of meeting minute from Winter 2022 – Approved
- Steve Hamstra – stepping down as TC chair
- Howard Newton will be replacing Steve as chair
- TC Needs corresponding members to step up as voting members
- Subcommittee Reports
 - Kirk T Mescher – Applications are due November 7th
 - The Application due date was extended.
 - Geothermal Handbook – A few additions, some edits, title change, change in use of terms. Some minor edits outstanding.
 - Geothermal handbook revisions are accepted.
- Heat Recovery Chapter is due next year – publish 2024
- Standards – Cary Smith
- Programs – Roshan Revankar
- Membership – Cary Smith
- Webmaster – Craig Buscher
- IAPMO – UMC 2024 – A few revisions to the next geothermal section.
- New chapter 17 in 2024 UMC
- USHGC – first code meeting for 2024 code
- IGSHPA – Updates to Website and business directory
- Use basecamp for all TC communication
- New business
 - Adding electrification and decarbonization
 - Groundsource should be an integral part of decarbonization initiatives
- A task force or building decarbonization is asking for liasons from technical committees
- TC6.8 should have a formal position on decarbonization
- 5°F test point provided for air source heat pumps
- Needed items to fit into a track for programming – decarbonization, using geothermal – August deadlines for programs, need an abstract
- Potentially a subsection on basecamp on our position towards electrification/ decarbonization and the benefits of geothermal
- Seminar proposals are due Tuesday, August 9th

- There exists a goal to have an additional meeting late September / early October
- Research update
 - Average research project - \$150k, 20 months
 - Looking for comments on RTAR before we send the proposal to RAC
 - Current RTAR is regarding thermal storage
 - Reached out to TC 6.9 and 7 for opportunities to co-sponsor.

Howard Newton



TC 6.8 (Research) Geothermal Heat Pump and Energy Recovery Applications

2022 Summer meeting in Toronto, ON, Canada

Conference Room: Sheraton, Linden (M)

T.C. 6.8 RESEARCH SUBCOMMITTEE MEETING MINUTES

Monday, Jun 27, 2022

3:30-4:30 PM (Eastern)

Minutes prepared by chair, Harrison Skye (harrison.skye@nist.gov)

1 Attendance

- Approx. 8 members attended the in-person meeting.

2 Research Chair Breakfast

- Section 6 Research Liaison: Stefan Ebel (StefanEbel@gmail.com)
- RAC "Research Breakfast": Jun 27, 2022
- MANDATORY: Project Evaluation Committee (PEC) and Project Monitoring Subcommittee (PMS) training is available on the ASHRAE Research Webpage: <https://www.ashrae.org/technical-resources/research>
- Publication Topic Acceptance Request (PTAR) process is officially available.
- Funds - Typical
 - Research Projects –12-15 new projects per year
 - Grants and Awards
 - Innovative Research Grants (\$125k over 3 years) -
 - New Investigator Award (\$125k over 3 years)
 - Grant In Aid –Typically 20-25 per year @ \$11,500
- COVID impacts
 - Unsolicited Research Projects – not considered right now
 - Grants and Awards delayed
 - Encourage members to donate!
- Research Strategic Plan approved: <https://www.ashrae.org/technical-resources/research/research-strategic-plan>
 - RTARs and WSs should address topic areas in RSP
 - RSP topic areas
 - i. Resilience
 - ii. IEQ –Environmental Quality in Occupied Spaces and Impacts on Work and Learning Health and Well Being, and Transmission of Airborne Infectious Viruses
 - iii. Sustainability, Decarbonization, Energy and Resources
 - iv. HVAC&R Equipment, Components, and Materials
 - v. Tools and Applications
 - vi. Education and Outreach
- Current Research activity:
 - Research activities picking up. 16 projects released for bid in 2022.
 - Current Total Value is \$16.1 M; total value of active projects is \$8.7M; avg duration is 20 months; average cost is \$149 K
 - The total value projects under contract exceeds the current annual budget for research, but we hope to implement most of these projects in the near future.
- In development - new web-based process for submitting and tracking research projects.
- New Basecamp sight for Research Subcommittee chairs
- RAC encouraging TCs to use basecamp to manage documents and communication (TC 6.8 already is)
- Project Monitoring Subcommittees -

- Meeting should be listed in the conference program or announced to TC (if it is not during conference). Ensure that Mike Vaughn and your Research Liaison are invited to all PMSc meetings.
- Should be regularly updating the TC of progress.

3 Existing Research Projects

3.1 Project Monitoring

3.2 Tentative Research Projects (approved for bidding)

- 1890-TRP “Minimum flow velocities for purging air and debris from hydronic piping systems.”
 - Co-sponsors TC 6.1 & 6.2
 - Status: PES reviewed bids. Recommending TC vote to reject bids and send WS back to RAC/MORTS for re-bid, since no proposals were acceptable.
 - TC meets in executive session to vote. Must be submitted by Tuesday, Jun 28, 2022 midnight (RAC meets Wednesday, Jun 29).
 - Projects released for bid: Mid October
 - Projects bids due from potential contractors: Mid December.
 - Should we consider reducing the pipe size requirements? The 8 and 12-inch pipe sizes may be too large.
 - Maximum GSHP pipe sizes tend to be about 8-inch.
 - Possible idea – have bidders subcontract the larger sizes.
 - Steve Hamstra will send Harrison contact who may be interested in doing the large pipe flushing work.
 - Project Evaluation Subcommittee: Lisa Meline (Chair), Gary Phetteplace, Lance MacNevin, Howard Newton, William Murphy, Harrison Skye
- Project Monitoring Subcommittee (Tentative): Harrison Skye (chair), Lisa Meline, William Murphy, Steve Tredinnick, Mike Trantham
- Consider whether the Work Statement should make the 8 and 12-inch pipe sizes optional, to increase possibility of finding a bidder. Labs can much more readily do 4 or maybe 6-inch sizes. Harrison will ask the District Energy members (Gary Phetteplace, Steve Tredinnick) what they think, since they would be most interested in the large pipe sizes.

3.3 Work Statements (WS)

- 1812-WS “Detection and Diagnosis of Leakage for Hydronic Systems”
 - Developed by TC 7.5 and which TC 6.8 agreed to co-sponsor has been returned for revisions; we don’t need to take any action now.

3.4 Research Topic Acceptance Requests (RTAR)

- “Evaluation of the costs and benefits of integrating ground source heat pumps (GSHP) with thermal energy storage (TES)”
- Draft prepared by Xiaobing Liu.
- Solicited feedback from TC 6.8.
 - Received one ASHRAE Journal article from Ed Lohrenz about GSHP with TES.
 - Looking for more feedback. Is there a better way to solicit feedback? Basecamp seems to be a minimally useful method.
 - Steve H. is doing project with ORNL to evaluate GSHPs combined with phase-change material.
 - Recently published a related paper with Univ. Of Dayton
 - Should we move to vote on this RTAR?
 - Give TC 2 weeks to review RTAR, then 2 weeks to vote.
 - Co-sponsorship – decided to solicit co-sponsorship from TC. 6.9 (Thermal Storage) and TC 7.4 (Exergy Analysis for Sustainable Buildings)

- Give TC 6.8 and co-sponsoring TCs 2-4 weeks to review. Then 2 weeks to do letter ballot. Then, submit to RAC.
- Send “clean” copy.

4 Research Results & Publications

- None

5 Research Topic Idea Discussion

-

5.1 Ideas proposed by members via email

- Conduct research on an ambient loop system. This was brought up at the end of the meeting and we didn’t have much time to discuss.
 - Proposal to conduct a research project on an existing ambient temperature loop (ATL) with several one-pipe connected ground heat exchangers (GHEX). The research will use the ATL at Colorado Mesa University in Grand Junction, Colorado that has been operation since 2012.
 - The research is very specific could be submitted to ASHRAE as an unsolicited research project. However, ASHRAE is not currently accepting URPs due to COVID-related funding reductions.
 - The TCs needs to think about whether there is a research need for which an RTAR should be drafted.

5.2 Ideas from previous TC meetings.

6 Other business

- Virtual meetings. Some discussion about virtual vs. In-person subcommittee meetings.
 - Will try to do this Research Subcommittee virtual next meeting. That will hopefully increase the attendance.
 - Suggest doing virtual meetings at least 2 weeks ahead of ASHRAE conference.
- Abbreviations. Reminder to avoid abbreviations, or spell them out when used. Would be good to have a list of common ASHRAE and GSHP abbreviations at the end of the meeting notes.

7 Old business

- Ambient Temperature Loops
 - A group previously met to discuss what are the research/presentation needs for these systems.

8 Adjourn

9 Useful links

- ASHRAE Research website: <https://www.ashrae.org/technical-resources/research>

TC 6.8 Research Attendance	
----------------------------	--

[illegible]



**TC 6.8 Geothermal Heat Pump and Energy Recovery Applications
Handbook Subcommittee**

2022 Summer meeting in Toronto, ON, Canada

Conference Room: Sheraton, Linden (M)

T.C. 6.8 2022 Handbook Update & Meeting

Friday, June 17, 2022

4:00-5:00 PM (Eastern)

Minutes prepared by chair, Matt Mitchell (matt.mitchell@nrel.gov)

All,

I've worked through all of the issues that had popped up due to problems translating from ASHRAE's publication software to Word. I've had to manually go back through the 2019 version and do a side-by-side comparison to make sure that all of the paragraphs/tables/figures were there and correctly labeled. There were multiple instances where I had to copy parts back over that were deleted or incorrectly labeled. If you plan to review, look out for strangeness like that. I think I got it all, but I could have missed something. I can give a more detailed accounting of these issues when we meet.

Summary of changes:

- Changing terminology to use "ground-source" etc. everywhere except for direct-use applications. There, "geothermal" is the term that was applied. This resulted in a title change to the chapter.
- New section on SWHP costs and performance.
- New examples on computing thermal properties from thermal response tests data, and on computing borehole resistance.
- Various minor or clarifying edits throughout.

Note that due to the addition of new sections (and these Word docs not having any built-in references to equation/figures/tables) I had to manually update all in-text references throughout. I think I've gotten it all lined back up, but please keep an eye out for ones that I've missed or incorrectly edited.

The current draft is here: https://www.dropbox.com/s/4kjobyeehwu1rrp/l-P_and_SI_A2019_Ch35.docx?dl=0

Feel free to review and let me know if you have any comments.

Talk to you tomorrow,
Matt

TC 6.8 Handbook Subcommittee

Friday 6/17/2022

4:00 PM– 5:00 PM **Eastern Time (ET)**



TC 6.8 Geothermal Heat Pump and Energy Recovery Applications Energy Recovery Subcommittee

2023 Winter Meeting in Atlanta GA

Conference Room: Omni CNN Center Atlanta, Maple (A-South)

T.C. 6.8 2023 Energy Recovery Subcommittee

Friday, January 20, 2022

11:00 AM - 12:00 PM(Eastern) Webex

Minutes prepared by chair, Mike Filler (fillerjr@yahoo.com)

2023 Winter Meeting Minutes

Attendee list:

Mike Filler

Craig Buschur

Carl Huber

Howard Newton

Rubens

Call to order & introductions

Howard is looking for a Programs Subcommittee Chair for TC 6.08

There is a recent RTAR that this subcommittee might be interested in

- "Evaluation of ground source heat pumps (GSHP) with thermal energy storage (TES) for residential and commercial buildings"
- Draft prepared by Xiaobing Liu, Michel Bernier, Masih Alavy, Harrison Skye.
- Received feedback and likely co-sponsorship from TC 6.9 (Thermal Storage)
- Submitting to TC 6.8 voting members for vote at Feb. 7, 2023 Main Committee Meeting.

Topic areas discussed include:

- Heat Recovery from refrigeration/RAC systems in grocery stores
- Refrigerant transition is underway for applied heat recovery and heat pumps – This will likely require further changes to the handbook chapter
- Thermal storage used with heat pumps
- Electrification of heat being a significant driver for decarbonization of buildings: Heat pumps of many different application methods will be needed

Action for the main committee:

Idea for programs, but without potential speakers yet: Thermal storage used with heat pumps

One thought is to ask manufacturers of some of these systems for volunteers to help join the committee. Some of them would likely be interested in assisting.



TC 6.8 Ground Source Heat Pump and Energy Recovery Applications

2023 Winter Hybrid Meeting

Location: Omni CNN Atlanta Georgia, Dogwood B (M1-North)

T.C. 6.8 2022 Programs Subcommittee

Tuesday, Jun 28, 2022

3:30-5:30 PM (Eastern)

Minutes prepared by chair, Roshan Revankar (roshanrevn@gmail.com)

1 Attendance/Introductions

Attached

2 Winter 2022 Conference:

Two sessions were submitted for this years conference. Of which 1 session was selected.

3 Next conference sessions

There were a lot of discussion around topics for next conference. Areas identified were District systems, New technologies and participation with other technical committees. Submission deadline is August 20, 2022.

4 Committee collaboration with Education

It was discussed that a proposal will be made to the TC that this committee be combined with the Education committee to coordinate efforts and have joint discussions.

Also, Roshan Revankar will be taking up the position of Vice Chair of TC. A new sub-committee chair will need to be inducted at the TC meeting.

Meeting ended at 2:00 PM. Minutes will be forward to the TC chair and committee members.

TC 6.8 Programs Attendance			
Name	Affiliation	Email	Phone (optional)
Ted Reinhart			
Brendan Hall			
Craig Buschur			
Kay Thrasher			
Howard Newton			
Steve Hamstra			
Roshan Revankar			



TC 6.8 Geothermal Heat Pump and Energy Recovery Applications 2022 KTM Award Recipient

2022 Summer meeting in Toronto, ON, Canada

Conference Room: Sheraton, Linden (M)

T.C. 6.8 2022 KTM Update

Tuesday, Jun 28, 2022

3:30-5:30 PM (Eastern)

Minutes prepared by chair, Lisa Meline (lisa@meline.com)

Kirk T. Mescher Award

- The Kirk T. Mescher Award was established in 2015 after the tragic loss of one of the brightest and most innovative LEED certified engineers, Kirk Mescher of CM Engineering. It was Kirk's passion to find new and creative ways to make projects as energy efficient but as simplistic as possible. In his honor, this award will be given out to professional engineers, teaching faculty, and engineering students who have that same passion. Applicants should have an idea in GSHP, HVAC, or energy efficiency that is simple and elegant and should want to put that idea to the test. The \$2000 award will be administered through the ASHRAE St. Louis Chapter and is currently available to all ASHRAE Members.

2022 KTM Award Recipient

- The **2022 KTM Award** recipient is Masih Alavy a Postdoc Fellow at Ontario Tech University. His work is focused on the development of novel thermal caissons for ground-source heat pump systems. He plans to use his award to purchase FLUENT, a computational fluid dynamics software license, to continue his work. The ASHRAE Toronto Section of ASHRAE will be presenting him with the \$2000 award on Tuesday, February 7th. I have requested that a photo of the award being made be sent to me so that we may post it on the TC6.8 website.
- For 2023, we will be revamping the award application and will be working to more widely distribute the information about this award since it is not offered through ASHRAE HQ. Thanks to Craig for keeping our award information updated on the website. I will send to him a write up and a photo after the ASHRAE meeting in Atlanta.

Lisa

IGSHPA

Message from the Executive Director

Happy 2023! We are excited to start off the New Year with a lot of very positive trends in our industry. Ending the year with one of our best annual conferences yet, we are already planning for this year's conference and prioritizing the projects that will be most valuable to our members and for growth of the organization. We would love your feedback on how you want IGSHPA to grow in the future.

In 2022, we continued to build IGSHPA's foundation and build reserves to put the organization in a sustainable position. By the end of the year, we had one year of expenses reserved. We are now at a point where we can add an administrative support person to our staff (see article below), which will allow us to increase our efforts in training, standards, and membership growth. If you know of anyone who would be a good fit for this position, please forward the [job link](#).

Towards the end of last year, we had an upgrade to our [business and member directory](#). If you haven't seen it yet, you'll want to check it out. The business directory now has an interactive map and a search bar to help potential customers find members. Plus, you have the ability to provide a description of the company, services/products offered, and geographical areas served. If you're not a business or corporate member, you may be missing out on the opportunity to showcase your company's offerings. If you're already a member, thank you!

Training has always been an important member resource. Last year, we formed a new training committee and our subcommittees started meeting to analyze the best approach for "modularizing" the Accredited Installer (AI) course to make it more accessible. We are also nearly finished with a new Certified Residential Designer (CRD) training. We started off 2023 with additional training development resources, thanks to Jim Cusack and Enertech Global. Enertech has graciously provided up to 20 hours per week of Jim's time to help with training committee work and curriculum development. This will make a big difference in our efforts this year.

Thank you Enertech and Jim Cusack!

Happy New Year!
Jeff Hammond
Executive Director
International Ground Source Heat Pump Association
jeff@igshpa.org

Events

Feb. 4-8, 2023: ASHRAE Winter Conference- Atlanta, GA

Feb. 6-8, 2023: AHR Expo- Atlanta, GA

Feb. 8, 2023: IGSHPA Town Hall

Feb. 22-23, 2023: Wisconsin Geothermal Assn. Annual Conference- Madison, WI

Feb. 24, 2023: IGSHPA Dig Deeper Webinar

Feb. 27- March 1, 2023: Iowa Geothermal Assn. Conference- Cedar Rapids, IA

March 8, 2023: Minnesota Geothermal Heat Pump Assn. Annual Conference-
Maple Grove, MN

March 14-16, 2023: 2023 Illinois Geothermal Conference- East Peoria, IL

April 26-27, 2023: NY-GEO Annual Conference- Albany, NY

**STAY UP TO DATE ON OUR UPCOMING EVENTS WITH OUR EVENTS
PAGE ON OUR WEBSITE: <https://igshpa.org/calendar/>**

Save the Date!

IGSHPA will be partnering again with NGWA for our annual conference, December 5 to 7, 2023, at the Convention Center in Las Vegas. Watch for details coming in February. We hope to see you in Vegas!

Dig Deeper for January

Don't miss January's Dig Deeper webinar on January 27 at 10:30am Central Time with Lance MacNevin of PPI (Plastics Pipe Institute). [Register here](#). Lance's presentation will address ***Recommendations on indoor piping materials for heat pump systems***. Inside or "indoor" piping refers to headers or manifolds inside vaults or buildings, the piping connecting ground loops to heat pumps, and the piping used to distribute hydronic energy throughout a building. This presentation will include best practices for inside piping and will describe the five types of plastic piping materials which are approved in mechanical codes for indoor piping. It will show where and how these materials are approved in current codes and will describe each piping material in detail. It will also provide access to several industry resources from PPI for use by specifiers, designers, and installers.

IAPMO Liaison Report



The International Association of Plumbing & Mechanical Officials

Lance MacNevin 1/30/23

This is a brief liaison report on IAPMO code development activities:

1. Work on the 2024 Uniform Mechanical Code (UMC) is complete. Requirements for geothermal systems have been moved from Appendix F to CH. 17, a mandatory part of the code. Cary Smith and Roshan Revankar are responsible for much of the content in this chapter.
2. Work on the 2024 Uniform Solar, Hydronic & Geothermal Code (USHGC) is progressing. Chapter 7 of this code contains requirements for geothermal systems. IAPMO coordinated meetings of a Geothermal TG throughout 2022 and into 2023 to prepare several public comments for the development process. Jeff Persons was Chair of that TG. TG members included Cary Smith and Roshan Revankar, Jeff Hammond, and me. The full USHGC TC meets next on May 16th in Ontario, CA to help finalize the 2024 version.
3. In 2022, IAPMO formed the Z1381 TSC to develop a new Standard for District Ambient Temperature Loops. Four TG meetings have occurred so far. Cary Smith is the Chair of this TSC. There is no adopted timeline for development of this standard.

Lance

MISSION AND VISION STATEMENT

IAPMO Codes and Standards provide innovative codes and standards solutions for the protection of the public's health, safety and welfare. We address the world's codes and standards needs to improve life for a better, more resilient tomorrow.