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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 1.10 DATE 2/5/2017

TC/TG/MTG/TRG TITLE Cogeneration

DATE OF MEETING 1/31/2017 LOCATION Las Vegas, NV

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Dragos Paraschiv	2016	Annette Dwyer	2016	Ahmad Abu-Heiba (PCM)
Blake Ellis	2015			John Andrepont (CM)
Geoff Bares	2016			Mark Armstrong (G)
Gearoid Foley	2015			Joe Brillhart (CM)
Farzin Rad	2016			Ersin Gercek (CM)
Richard Sweetser	2016			Josh Gibbons (G)
Tim Wagner	2016			Tim Halsor (G)
Birol Kilkis (non quorum)				Leslie Johnsson (G)
				Alok Kumar (G)
				Ellen Makar (G)
				John Molnar (CM)
				Kurt Monteiro (G)
				Manalee Nabar (PCM)
				Daniel Pyewell (G)
				Harold Smith (CM)
				Ian Spanswick (CM)
				Tim Unruh (G)
				Gordon Williams (CM)

DISTRIBUTION: ***All Members of TC/TG/MTG/TRG plus the following:***	
TAC Section Head: Amir Jokar	SH1@ashrae.net

Christopher G Phelan, CTTC Research Liaison Shinsuke Kato, PhD, Research Liaison James W Bochat, ALI/PDC Florentino Roson Rodriguez, PE, Handbook Liaison Rick M Heiden, Standard Liaison	CTTC1@ashrae.net RL1@ashrae.net PDCchair@ashrae.net HBS5@ashrae.net SL1@ashrae.net
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 TC 1.10 COMMITTEE MINUTES
Las Vegas, NV
January 31, 2017

The TC 1.10 meeting was called to order by the Vice Chair, Dragos Parashiv, at 2:31 PM.

1. Vice Chair Dragos Parashiv welcomed all members and acknowledged the guests. Dragos mentioned that chair Annette Dwyer couldn't travel to the meeting and without the Remote Participation Module (RPM), she wouldn't be able to attend.

2. Self-introductions were made by all present. TC 1.10 has eight (8) quorum Voting Members of which six (6) were present. Hence, a quorum was established. In addition, a non-quorum voting member was also present. (Note: one additional voting member did arrive partway through the meeting, that is why the voting counts changed.)

3. Secretary Blake Ellis read the TC 1.10 mission statement.

   Mission Statement: TC 1.10 is concerned with cogeneration systems, their cycles, and components including heat recovery, energy conversion, and system integration. The systems provide both power (electric and/or shaft) and thermal energy (heating and/or cooling) and are variously known as cogeneration systems; trigeneration systems; combined heat and power (CHP); combined cooling, heating, and power (CCHP); and integrated energy systems (IES).

4. Approval of the Minutes

   Copies of the draft minutes of the meeting held in St. Louis, MO were distributed to the attendees of the meeting. One modification was made to change the text under 6A to "will present" instead of "presented".

   MOTION - Geoff Bares made a motion to approve the minutes of the St. Louis Meeting with noted corrections. The motion was seconded by Farzin Rad and approved (7-0-0 CV)

5. **Subcommittee Reports**

   a. Programs: Rich Sweetser (subcommittee chair)

   Las Vegas (Winter 2017) Program:

   Rich reported on the seminar that was held at 8:00 am on Monday and there were about 90 people at the seminar. The title was titled "Past, Present and Future of CHP Systems in Mission Critical Facilities". The program had the following speakers:

   Dr. Bruce Hedman: Combined Heat and Power: A Robust, Efficient, Economical and Clean Solution for Critical Infrastructure, Microgrids and Resiliency

   Gearoid Foley: Resilient CHP Design for Mission Critical Facilities while Minimizing the Impact on Energy and Water Usage

   Rich Sweetser: Progress Report on U.S. Department of Energy CHP for Resiliency Accelerator

   Long Beach (Annual 2017) Program:

   Technical programs for Long Beach was discussed and no technical sessions sponsored by TC1.10 are planned for Long Beach.

   Chicago (Winter 2018) Program:

   Richard indicated that Track 4 – Earth Wind and Fire as being targeted for a seminar at the Chicago conference. Richard described a program that he is pulling together for the meeting. The current proposed title is "How to thrive during your next natural disaster – Three operational Combined Heat and Power (CHP) case studies." The theme of the seminar is to have case studies of three different CHP systems at a

hospital, university and possibly a manufacturing plant. A case study outline was also presented. This program had great support from the subcommittee meeting and will be voted on by the main committee in Long Beach. See Attachment 1 to these notes for additional information about the Chicago Meeting.

Houston (Annual 2018) Program:

Richard mentioned that CEC is considering a cogeneration track in Houston. Blake will follow up with CEC to confirm.

b. Research: Dragos Paraschiv (subcommittee chair)

Dragos updated the committee that the work statement (WS) was approved by Research Activities Committee (RAC) at their fall meeting. It now has a project number. The proposal evaluation subcommittee and potential bidders needs to be completed. If all goes well, it will go out for tender in the Spring of 2017. There are at least three bidders that have been identified. Dragos also noted that the project evaluation subcommittee is make up of Jay Eldridge (TC 6.2), Geoff Bares (TC 6.9) and Dragos from TC 1.10.

Dragos attended the research meeting on Monday and announced the following:

- Three (3) RTAR's were evaluated (3 accepted, 0 accepted with comments, 0 rejected)
- Four (4) WS evaluated (1 conditionally accepted, 3 returned)
- Innovative Research Grant is a new process for research projects. There have been 33 ideas submitted, 6 proposals have been developed and a few are expected to be funded. That process is expected to be repeated in the future.

Dragos also mentioned that TC 1.10 has co-sponsored some RTARs, but he did not know the status of those RTARs as the response goes back to the originating TC.

c. Handbook: Dr. Tim Wagner (subcommittee chair)

Tim mentioned that this committee is responsible for Chapters 7 and 8 of the 2016 HVAC Systems and Equipment. Chapter 7 is titled Combined Heat and Power Systems and Chapter 8 is titled Combustion Turbine Inlet Cooling.

Tim provided an overview of the process to improve and update the handbook to the committee. Because both chapters were just issued last year, he is just starting to ramp up the process for the 2020 Handbook. Tim indicated that he is looking for information on areas that need to be improved in the next cycle.

Geoff Bares indicated that the 2012 version of Chapter 8 had a major overhaul and he did not expect a major update in this version.

There was a discussion regarding the title of the new section called Combined Heat and Power and the TC 1.10 committee name is Cogeneration. There was a discussion to possibly change the name of the committee to CHP. **This will be added to the 2017 Annual Meeting agenda in Long Beach** for discussion by the committee.

d. CTIC Subcommittee: Geoff Bares (subcommittee chair)

Geoff reported that majority of the items on the CTIC have been discussed. Those are the research project described above and the handbook chapter.
There was a discussion about the need for the CTIC subcommittee. **The topic will be added to the 2017 Annual Meeting agenda in Long Beach** for discussion by the committee.

e. Membership: Annette Dwyer (subcommittee chair)

Dragos Paraschiv reported that currently we have eight (8) voting members and one non-quorum voting member. It is now time to update the roster and the voting members are planned to be the same for the next society year (2017-2018). Dragos asked for anyone wanting to be added to the roster as a corresponding member to hand him a business card with your ASHRAE membership number and you will be added. Dragos also described the process to become a member of the committee by signing up on the website.

f. Web Site: Blake Ellis (webmaster)

Blake reported that the TC 1.10 website was transferred to the new ASHRAE TC website template and is up to date. Please contact him with any suggestions for webpage contents.

g. Honors & Awards: Annette Dwyer (subcommittee chair)

Dragos indicated that he was not aware of committee members getting an award at this meeting. Blake summarized that the Hightower Award is an award given to people related to technical activities. Nominees are submitted to the TC section head by September 1.

Blake also indicated that some ASHRAE Awards are self-nominating. He specifically called out the Distinguished Service Award and Exceptional Service Award, both of which are due on May 1. This is simply a form to fill out and if you have enough points, you get the award. Blake also encouraged keeping ASHRAE Bios up to date.

h. Standards

Dragos mentioned that Mark Davis is the subcommittee chair and he is still involved with SPC 204, but he was unable to attend the meeting. SPC 204 will be covered under its own agenda item.

ASHRAE Standard 100:
Richard Sweetzer has been involved in TC 1.10 and he provided an update on the meetings earlier in the day. Richard provided an overall summary of what the standard covers and how the standard works. It is an EUI based standard that if an existing building exceeds the EUI an energy audit must be performed and the ECMs with less than four years must be implemented.

The standard is based on site energy and not source energy and, therefore it hinders buildings that have CHP from complying. The committee worked on modifying the standard over the last two years to include the option of using source energy. The revision was out for public review, comments were received and the committee is worked through the comments and has not approved making any substantive changes. The committee is in the voting process. It is expected to be completed in the next few weeks. It will either be approved and go out for publishing.

A question was raised about any jurisdiction has implemented the standard, however nobody knew how many jurisdictions.

i. SPC 204P
Method of Test of Micro CHP Devices.

Dragos reported on the SP 204 committee meeting the night before. The next phase for the document is public review. Technical changes were discussed last night and some editing needs to be completed. There is a goal to have a call of SPC 204P on Feb 13rd. ASHRAE will place it in public review on Feb. 17th. In addition, TC 1.10 will be asked to provide feedback on the document during the Public review period.

There was a question about having someone from DOE and AHRI to make sure they provide comments. Dragos mentioned that development of this standard started in 2010.

6. **Chairman's Overview and Report:** Annette Dwyer

Dragos attended the TC Chairs Breakfast for Annette Dwyer and reported the following highlights:

- Awards: 2016-2017 Hightower. Paul Lindal is receiving. He is involved with TC 3.6 and TC 8.6.
- A technology portal is now available for members to access research information.
- One new MTG was created. (MTG.ACR Air Change Rate)
- New ASHRAE Authoring portal was described that will be used for updating the Handbook.
- ASHRAE calendar is now available on the Google Calendar.
- They are looking for feedback for ideas for 2018 meetings, contact Tony Giometti with ASHRAE staff.
    - **MOTION -** Geoff Bares made the motion and Farzin Rad seconded "That the Chair of TC 1.10 write a letter that the Technical Committee supports a track at the Houston conference entitiled Cogeneration." (7-0-0, CNV)

7. **Old Business:**

John Andrepont provided an IDEA liaison report. See Attachment 2 to this document for his report.

8. **New Business:**

Tim would like make a note on the committee report that the online app for providing reviews for sessions at the conference was very cumbersome. Tim also wanted to put in the meeting notes that the online app for the meeting schedules was incorrect.

The meeting times for the for the 2017 Annual Conference in Long Beach was discussed. Dragos indicated that the following request would be placed for meeting times:

- Tuesday (June 27th) will be requested.
- TC 1.10 Handbook, Program, Research, CTIC, Membership Subcommittee 1:00 pm – 2:30 pm
- TC 1.10 main meeting from 2:30 pm - 4 pm
- A remote participation conference will be requested.

Adjourn

Geoff moved that the meeting be adjourned. Tim seconded the motion and it was approved (7-0-0, CNV).

Minutes prepared and respectfully submitted by Blake Ellis, TC 1.10 Secretary.

Attachment 1 – 2018 Chicago Winter Meeting Program Info

TC 1.10 Proposed Program:

Chair Dr. Timothy Wagner

Track #4; Earth, Wind and Fire:

Seminar: **How to thrive during your next natural disaster – Three operational Combined Heat and Power (CHP) case studies.** Designing for natural elements and other possible disasters often requires thinking beyond the norm. Building design and materials are critical for resilient operation, however, assuring building systems operate when the electric grid is down requires increased scrutiny of onsite power systems. Hurricane Katrina, Superstorm Sandy and Winter Storm Nemo provide informative case studies on the CHP installation economics, performance during a major natural disaster and the impact of operations during the event.

1. Hurricane Katrina and Jackson Memorial Hospital's 3.5 MW CHP System – G Foley
2. Superstorm Sandy and Princeton University's 15 MW CHP System – R Sweetser
3. Winter Storm Nemo and Frito- Lay's 4.2 MW CHP System - B Hedman

Each case study will follow the following outline:

1. Site information
2. Site output (patient care, education, potato chips)
3. CHP system design
4. CHP operating system economics
5. CHP non-energy benefits
6. Describe the "event"
7. Describe the CHP system operation during the event
8. Describe the benefits resulting from the operation of the CHP system during the event

Track 1: Systems and Equipment Track Chair: Carrie Anne Crawford Email: carriecrawford@eeace.com
Selection of equipment and systems is paramount to HVAC&R design. Papers and programs in this track will assist designers, engineers, and operators in the design, selection, and operation of HVAC&R systems and equipment.

Track 2: Fundamentals and Applications Track Chair: Kevin Marple Email: kmarple@benzco.com
Fundamentals are the foundation for understanding applications in engineering. Key components of ASHRAE fundamentals include thermodynamics, psychometrics, fluid and mass flow, IAQ, and building envelope. This track provides opportunities for papers and presentations of varying levels across a large topic base. Concepts, design elements and shared experiences for theoretical and applied concepts of HVAC&R design are included.

Track 3: Standards, Guidelines and Codes Track Chair: Corey Metzger Email: corey.metzger@resourcece.com
ASHRAE is known for its standards and design guidelines – and they are constantly evolving with the intent on improving the built environment and its systems. Designers, Contractors, Architects and Owners must be able to keep up with the continuing changes in the current cycle but to also be prepared for the future changes. In addition, there is a large interaction of ASHRAE with the code authorities and government to incorporate these standards and guidelines. The series of sessions in this track highlight the changes to the standards and guidelines, their projected path and optimum design techniques to meet or exceed the standards.

Track 4: Earth, Wind & Fire Track Chair: Ashish Rakheja Email: ashish.rakheja@aeonconsultants.in
Designing for natural elements and other possible disasters often requires specific elements of building design and construction. From materials to stabilizing elements and simulations to specifications, these options must be incorporated. This track will deliver on modern strategies to address all of these conditions. Be prepared to be blown away by industry practices to prevent disastrous results.

Track 5: Transportation IAQ and Air Conditioning Track Chair: Dimitris Charalambopoulos Email: dimitris@ashrae.gr
Often considered boutique engineering, both enclosed vehicular facilities and transportation design, construction, operation, and maintenance needs to be elevated to equal status with other HVAC applications. These systems require the same design approach as other system designed but usually have special technical requirements that mandate close velocity capture/control, air quality control, etc. that can be overlooked but the more traditional building system design engineer. This track will seek case studies and trouble-shooting projects highlighting the opportunities and pitfalls associated with these unique applications.

Track 6: Tall Buildings Track Chair: Leticia Neves Email: leneves@gmail.com
Chicago is home to one of the tallest buildings in the world. One that stood the tallest in the world for nearly 25 years. However, today, more and more tall buildings are being designed and constructed. This track will draw upon “larger than life” case studies, as well as large building HVAC systems that can be classified as “innovative and/or 21st century” that highlight the opportunities presented and achieved by the designer, builder, and operator for facility HVAC systems throughout the world.

Track 7: Modeling Throughout the Building Life Cycle Track Chair: Joseph Firrantello Email: j.firrantello@gmail.com
Modeling was originally concerned primarily with building and system design specifications. The demands of energy efficient operation brought about the need for modeling of part-load operation for a variety of off-design conditions. The explosion of computational capacity and data collection capability is rapidly expanding the scope, complexity and practical applications of modeling both during design, but even more so for fault detection, diagnostics and operational optimization. Thirty years ago, people were dreaming of doing some of the things that Building Information Modeling is now bringing to reality. Presentations and papers are solicited related to all aspects of building modeling, with a particular interest in successful applications that have extended modeling into operational phases of the building life cycle.

Track 8: Heat Exchange Equipment Track Chair: Vikrant Aute Email: vikrant@umd.edu
Given the critical importance of energy efficiencies and reliability of HVAC systems, new heat and mass transfer HVAC & R equipment and advanced systems have been developed. Bringing non-traditional technologies to the actual field is not trivial task and how to design the equipment and characterize the performance of new HVAC &R technologies under real field type conditions are still open questions. The papers and programs in this track will inform designers, engineers, building energy simulation modelers, and energy consultants and practitioners in the use of non-traditional heat exchange equipment and advanced HVAC &R systems under real field type conditions. The track will focus on fundamentals and applied aspects, on current challenges and recent advancements for managing frost growth, water condensate, fouling, corrosion, and mitigation of mold growth and bacteria that are often encountered in heat exchange equipment when working under real field type conditions.

Track 9: Refrigerant Mini Track @ Expo* Track Chair: Gary C. Debes Email: gcdebes@verizon.net
*Section will determine topics, speakers, session types, etc.

Attachment 2 – IDEA Liaison Report

Prepared and presented by: John Andrepont (+1-630-353-9690 / CoolSolutionsCo@aol.com)

The International District Energy Association (IDEA) is an industry association of ~2,000 members. The membership includes: District Energy (Thermal) Utilities; Physical Plant and Utilities Personnel from University, Medical, and other District Energy Facilities; Equipment Manufacturer/Suppliers; Service Providers to the Industry; other District Heating & Cooling Associations; plus Government, Student, and other Personal members.

IDEA has two major conferences each year (one focused on campus District Energy systems and one focused on commercial thermal utility District Energy systems), as well as smaller workshops on subjects such as marketing and thermal distribution, plus occasional regionally-focused conferences. Each major conference also focuses on integrating Combined Heat & Power (CHP) and Thermal Energy Storage (TES) with District Energy.

Upcoming IDEA conferences include:

- 30th Annual Campus Energy Conference
  February 20-24, 2017 – Miami, Florida
- 108th Annual Conference and Trade Show
  June 26-29, 2017 – Scottsdale, Arizona *(Note: these dates conflict with the 2017 ASHRAE Annual Meeting)*
- 31st Annual Campus Energy Conference
  March 5-9, 2018 – Baltimore, Maryland
- 109th Annual Conference and Trade Show
  June 11-14, 2018 – Vancouver, British Columbia, Canada
- 32nd Annual Campus Energy Conference
  February 26-March 1, 2019 – New Orleans, Louisiana

For further information on IDEA, contact:

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