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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. 6.7 DATE January 18, 2019

TC/TG/MTG/TRG TITLE: Solar and Other Renewable Energies

DATE OF MEETING January 15, 2019 LOCATION Atlanta, GA, USA

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Khalid Nagidi, VM	07-01-2018	Cary Smith, VM	07-01-2016	Omar Abdelaziz (Research Liaison)
Svein Morner, VM	07-01-2018			Dawen Lu (Section 6 Chair)
Costa Kapsis, VM	07-01-2018			Julia Niccotemus, Guest
Tim Merrigan, VM	07-01-2016			Costas Balaras, CM
Marija Todorovic, VM	07-01-2017			Janice Means, CM
Mike Case, VM (remote)	07-01-2017			Jim Cika, Guest
Gaylen Atkinson, CM				Louis O'Berry, Guest
Mark Hertel, CM	07-01-2013			Mark Herberg, Guest
				Dennis Coop, Guest
				John Karakesh, Guest

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

TAC Section Head: Dawen Lu	SH6@ashrae.net
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)	Mr. Erick Phelps (Standards) sl6@ashrae.net Mr. Omar Abdelaziz (Research Liaison) omar.abdel.aziz@gmail.com Mrs. M Maggie Moninski (CCTC) ctt6@ashrae.net Ms. Suzanne LeViseur (2019 HVAC APPLICATIONS) sleviseur@haddadeng.com Mr. Nicolas Lemire (2020 HB Systems & Equipment) nlemire@pageaumorel.com
Mike Vaughn, Manager Of Research & Technical Services	MORTS@ashrae.net

MEETING MINUTES
ASHRAE TC 6.7 – SOLAR AND OTHER RENEWABLE ENERGIES
Winter Meeting – January 15, 2019
Atlanta, GA, USA

1. Call to order & Introductions. The meeting was called to order by Chair Khalid Nagidi at 1:08 pm, January 15th, 2019 and introductions were made.
2. Code of Ethics: Chair read from the ASHRAE Code of Ethics. Chair noted that the agenda contains a link to ASHRAE Code of Ethics as well as to the Technical Committee Manual of Procedures (MOP).
3. Quorum. It was determined that 6 of 7 voting members were present (Mike Case on the telephone). A quorum was present.
4. Agenda Review. Chair reviewed the agenda. No changes were proposed and the TC secretary (Mike Case) was asked to track action items.
5. Approve minutes
 - a. The minutes from the summer meeting in Houston, June 26, 2018 were reviewed. Chair moved to approve. Costa Kapsis seconded.

VOTE: Houston minutes were approved 5-0-0-1-CNV.

- b. The minutes from the winter meeting in Orlando, January 25, 2016 were reviewed. Minor corrections were made to attendees. Chair moved to approve. Marija Todorovic seconded.

VOTE: Orlando minutes were approved 5-0-0-1-CNV.

6. Announcements
 - a. Chair reviewed the current roster for 2019-2020. Refer to attached agenda for roster.
 - b. Chair discussed ASHRAE Basecamp 3. Refer to agenda for information. Chair highly recommended basecamp and a number of members attested to its utility.
7. Old Business
 - a. Chair asked Mike Case to update action items from the Houston minutes.
 - 11.a. Mike Case to wrap up Orlando minutes - Complete
 - 11.b. Handbook. Costa Kapsis to submit chapter 35 to ASHRAE handbook committee. - Complete
 - 11.c. Standards. Marija to write up BIPV standard draft idea. – Deferred and dropped from action item list. Revisit at a later date.
 - 11.d. Research. Janice Means to get together with Jim Leidel in the next month to discuss RTAR. – Complete.
 - 11.e. Website. Member send materials to Svein Morner for website. - Complete
 - 11.f. Khalid Nagidi & Cary Smith to act as liaisons to 90.1 WG - Complete
 - b. ASHRAE Learning Institute “[Solar PV & Thermal Systems Analysis and Design](#)” Course Update. Chair reported that this short course was conducted on Monday, January 14 (8:30 am – 11:30 am), at Georgia World Congress Center by Khalid and Svein. The course went very well and was attended by 33 people.
 - c. SSTC 90.1 Working Group on Renewable Energy (Kathrine Hammack). Cary Smith and Khalid Nagidi to act as liaisons. Chair reports that he exchanged email with Katherine Hammack once, but nothing more.

- d. Chair reported on items from the Chair's breakfast
 - d.1 Biomass will go into TC 6.10, Fuels and Combustion.
 - d.2 Chair TCs asked TC to look for positions for young engineers in TCs. Dawen Lu, section 6 Head commented about young engineer's meeting and invited attendance from any young engineers present.
 - d.3 ASHRAE considering reorganization of TCs. Chair sent out a handout and feedback form. Chair summarized memo. Members should provide feedback individually as specified. Some discussion of whether to have a unified committee response. General discussion of pros and cons of proposed changes followed.
 - d.4 Chair gave statistics on Atlanta events.
 - d.5. Chair asked members and guests for ideas on how to attract young members. Some ideas included:
 - create card/bookmark to hand out to attract people
 - some discussion about how students get into careers they are interested in
 - students need to be proactive about seeking out internships in their area.
 - can committee support internships as well?
 - get ASHRAE to link mentors (from TC 6.7) with mentees?
 - Need to look at ASHRAE policy on social media.
 - can committee establish a LinkedIn online account?
 - TCs should have an Outreach position.
 - Make greater use of LinkedIn, Facebook and YouTube.
 - Camera or PowerPoint viewing of conference events.
 - ASHRAE put everything online?

6. Subcommittee Reports

a. Handbook – Marija Todorovic

- a.1 2020 ASHRAE Handbook-HVAC Systems and Equipment, Chapter 37-Solar Energy Equipment (Costa Kapsis to lead the review process).
- a.2. ASHRAE asked that we provide handbook by May 26th. Will not meet until after that, so will do virtually. Invite everyone to comment in basecamp.
- a.3. Dates:
 - January 18th – Costa will send out email to members on chapter 37 for comment.
 - April 30th – comments due back.
 - May 22nd – sent to voting members
 - June 22nd – vote
- a.4. Request extension from Ms. Kennedy to June 26th, should not be a problem.
- a.5. Marija, Janice, Tim invited to collaborate w/ TC 2.5 climate change
- a.6. Collaborate with other renewable-related TCs? e.g., Heat Pumps. Discussion of whether heat pumps are renewable. Comment made that in U.S., IRS allows tax deduction for geothermal heat pumps as renewable

b. Program - Costa Kapsis

- b.1. Costa discussed seminar at this meeting and that it went well. Current conference – had a Seminar cosponsored by us. Went well.
- b.2. Course given by Khalid and Svein also went well
- b.3. Upcoming conference in Kansas City will be held on June 22-26, 2019. Request for Program are due on Friday, Feb 8th
- b.4. Ideas:

- Considering wind or net zero energy communities – expand to other renewables besides solar
- Wind 101 idea
- integrate renewables into smart grid
- markets
- BIPV envelopes
- heat pumps/storage
- micro hydro
- Submit ideas to Costa Kapsis by 20 Jan
- Possible topic: what NOT to do. Possible rewording. Solar Air – newest advances and what’s possible. e.g., integrated Li ion batteries for load shifting.
- ASHRAE Pres. rethink the grid and buildings – see her Facebook page

c. Research - James Leidel

- c.1. Discussed RTAR proposal and budget.
- c.2. March 15th is the due date to submit the RTAR
- c.3. Janice Means proposed minor change under ‘benefits to ASHRAE’ section.
Can we do it in 24 months? Want contractor to finish it off. Be careful about offloading revisions to TC. More to be done after TC vote.
- c.4. Jim went over 2 year budget – just under \$150K
- c.5. Chair motioned to approve the proposed RTAR with minor modifications. Costa Kapsis seconded.

VOTE: The motion to approved the RTAR with minor modifications was approved 5-0-0-1 CNV

- c.6. Omar Abdelaziz, (ASHRAE Research Liaison) discussed how many RTARS submitted, approved, etc. Discussed student awards, service to ASHRAE research award. In response to a question official maximum. Mentioned that a recent project was awarded about \$850K

d. Standards - Mike Case

- about maximum funding for an RTAR, stated that there is no
- d.1. BIPV standard. There has been a general desire to write a proposal for a Building Integrated Photovoltaics standard. However, other activities have precluded time to complete it. After general discussion, it was decided to drop it from the action list, but to possibly bring it up for discussion again in Orlando. Some discussion of what it takes to adopt an existing standard and whether that was ever done. Costa Kapsis prepared a nice summary of existing standards that is attached.
- c.2. Interaction with 90.1 renewables. Mike Case will email Katherine Hammack to see if there is any more follow up warranted with 90.1.

e. Website - Svein Morner

- e.1. Roster updated automatically
- e.2. Technical FAQ page (Refer to Attachment A in agenda)
- e.3. Material for TC6.7 website. Request that Chair email to Svein anything to be posted on web page

7. New Business - None

8. Action Items

- a. Request ASHRAE policy on social media – Khalid Nagidi.
- b. Email Katherine Hammack regarding future interactions with SC 90.1 renewables.

9. Adjourn. Chair adjourned at 1530

Respectfully submitted,
Mike Case, TC 6.7 Secretary

Summary of Building Integrated Photovoltaics Standard Activity.

Courtesy of Costa Kapsis

Q1. What is the most important international standard expected to be adopted in Building Integrated Photovoltaic (BIPV) and what does it cover?

A1. The most important standards expected to be adopted in BIPV are IEC 63092-1 & 2.

It is a two-part umbrella standard that focuses on the following requirements for products and systems, respectively. The two parts are products of a liaison between IEC TC82 and ISO TC 160 and it.

- General requirements
- Electrical requirements
- Building-related requirements
- Requirements for products with glass panes
- Requirements for products without glass panes
- Labelling requirements
- System documentation, commissioning tests and inspection requirements

Descriptions as appears under IEC:

(ref:

https://www.iec.ch/dyn/www/f?p=103:38:8299336743964:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1276,23,23167 ;
https://www.iec.ch/dyn/www/f?p=103:38:8299336743964:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1276,23,22310)

IEC 63092-1 - Photovoltaics in buildings - Part 1: Building integrated photovoltaic modules

"This document applies to photovoltaic modules used as construction products. It focuses on the properties of these photovoltaic modules relevant to essential building requirements and the applicable electro-technical requirement. This document references international standards, technical reports and guidelines. For some applications in addition national standards (or regulations) for building products may apply in individual countries, which are not explicitly referenced here and for which harmonized international standards are not yet available.

The document is addressed to manufacturers, planners, system designers, installers, testing institutes and building authorities.

This document does not apply to concentrating or building-attached photovoltaic modules.

This document addresses requirements on the PV modules in the specific ways they are intended to be mounted but not the mounting structure itself, which is within the scope of IEC TS63092-2."

IEC 63092-2 - Photovoltaics in buildings - Part 2: Building integrated photovoltaic systems

"This document applies to photovoltaic systems that are integrated into buildings with the photovoltaic modules used as construction products. It focuses on the properties of these photovoltaic systems relevant to essential building requirements and the applicable electro-technical requirements.

This document references international standards, technical reports and guidelines. For some applications in addition national standards (or regulations) for building systems may apply in individual countries, which are not explicitly referenced here.

The document is addressed to manufacturers, planners, system designers, installers, testing institutes and building authorities.

This document does not apply to concentrating or building-attached photovoltaic systems.

This document addresses requirements on the BIPV systems in the specific ways they are intended to be mounted but not the BIPV modules as construction products, which is the topic of IEC 63092-1."

For more information on BIPV R&D and standards, see also IEA PVPS Task 15: <http://www.iea-pvps.org/index.php?id=task15>

Q2. Are there any international standards on photovoltaic glass and what do they cover?

A2. On October 2018, ISO published a standard on PV glass.

ISO/TS 18178:2018: Glass in building - Laminated solar photovoltaic glass for use in buildings

(ref: <https://www.iso.org/standard/74652.html>)

Description as appears under ISO: "This document specifies requirements of appearance, durability and safety, test methods and designation for laminated solar photovoltaic (PV) glass for use in buildings. This document is applicable to building-integrated photovoltaics (BIPV). Building-attached photovoltaics (BAPV) can refer to this document."

Also, there is an effort to update existing ISO standards to include BIPV technologies. Such an example is:

ISO 19467:2017: Thermal performance of windows and doors - Determination of solar heat gain coefficient using solar simulator

"ISO 19467:2017 specifies a method to measure the solar heat gain coefficient of complete windows and doors.

(ref: <https://www.iso.org/standard/64989.html>)

Description as appears under ISO: "ISO 19467:2017 applies to windows and doors a) with various types of glazing (glass or plastic; single or multiple glazing; with or without low emissivity coatings, and with spaces filled with air or other gases),

b) with opaque panels,

c) with various types of frames (wood, plastic, metallic with and without thermal barrier or any combination of materials),

d) with various types of shading devices (blind, screen, film or any attachment with shading effects),

e) with various types of active solar fenestration systems [building-integrated PV systems (BIPV) or building-integrated solar thermal collectors (BIST)]."

Q3. Are there any international standards on managing fire risk related to photovoltaic systems on buildings and what do they cover?

A3. Requirements related to fire resistance, propagation and safety are addressed under local and national building and fire codes.

While harmonized international standards are not yet available, there is currently an effort to develop an IEC technical report focusing on requirements related to PV on buildings.

IEC TR 63226. Managing fire risk related to photovoltaic (PV) systems on buildings

(ref:

https://www.iec.ch/dyn/www/f?p=103:38:9254899702586:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1276,23,102641)

While not a standard, this technical report under development discusses fire prevention measures during the design, installation, commissioning and maintenance of PV systems (including BIPV) on buildings. It also addresses measures to support firefighters during intervention on buildings with PV systems and provide guidance on how to handle the PV systems after a fire or

structural collapse. The objective of this technical report is to assist local building and fire codes by guiding the development of a risk assessment (regarding fire, people's safety, and financial) for buildings with PV systems, based on building use, PV location and on-site conditions.