



Shaping Tomorrow's
Built Environment Today

MINUTES (DRAFT)

**Refrigeration Committee Technology Committee
for
Comfort, Process, and Cold-Chain
(REF-CPCC)
Fall Meeting,
Thursday Oct. 1st, 2020
Web Meeting**

These minutes have not been approved and are not the official, approved record until approved by this committee.

VOTING MEMBERS PRESENT:

Yunho Hwang, *Chair*
Didier Coulomb
Martin Dieryckx
Steve Kujak
Charles Hon
Tony Welter
Harshal Arvind Surange
William Walter

NON-VOTING MEMBERS PRESENT:

Kashif Nawaz – Res. Subc. Chair

VOTING MEMBERS NOT PRESENT:

Ayman Eltalouny
Stephen Gill, *Vice-Chair*
Carlos Alberto Mitroga
Dustin Lilya

ASHRAE LEADERSHIP PRESENT:

Wade Conlon, BOD Ex-O
Bill McQuade, TechC Coord. Officer - Absent

ASHRAE STAFF:

Mike Vaughn, MORTS

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MOTIONS

No.	Motion	Page
1	2020 REF-CPCC Committee minutes from the 2020 Annual meeting be approved. Motion Passed 7-0-1-4 ¹ (12) CNV MD/SK	1
2	That the REF-CPCC Manual of Procedures Section A Part 2 - Membership be modified to include a voting member representative from International Associations IIR & UNEP and included on REF-CPCC roster each year as a liaison voting member. Motion Passed 7-0-1-4 ² (12) CNV MD/HS	1
3	Motion to adjourn meeting - Motion Passed 7-0-1-4 ³ (12) CNV – Meeting adjourned at 11 am on October 1 st .	6

NEW ACTION ITEMS – Fall 2020 – Meeting

No.	Responsibility	Action Item	Status/ Page
1	Staff	Prepare draft text to the REF-CPCC Manual of Procedures (MOP) Section A Part 2 – Membership be modified to include a voting member representative from International Associations IIR & UNEP and included on REF-CPCC roster each year as a liaison voting member.	New / 2
2	Chair & Members	Recommend new members to be added to the REF-CPCC committee for SY 2021-2022 and pass on to Chair & BOD ExO as soon as possible.	New / 2
3	Staff	Send IIR – IIF - ASHRAE Five Fundamental Cooling & Refrigeration terms to REF-CPCC membership.	New / 2
4	Dieryckx	Propose alternate text or edits to IIR - IIF concerning the Five Fundamental Cooling & Refrigeration terms to address Heat Pump issue.	New /
3	Ayman	Award Subc. meet between now and Oct. to combine the Milt Garland and Comfort Cooling award and then evaluate the application from the Hong Kong Chapter. Also meet in the fall to select a SY 19-20 recipient for the George Briley ASHRAE Journal Article Award	New / 2
4	Nawaz	Kashif Nawaz has volunteered to chair the REF-CPCC Research Subc. in place of Chair Yunho. TC 6.8, 8.4, and 8.6 have also agreed to work with us. This group of TCs has already brainstormed 15 research topics to explore further that they will share with us.	New / 2

¹ Gill, Eltalouny, Mitroga, Lilya absent for minutes vote

² Gill, Eltalouny, Mitroga, Lilya absent for minutes vote

³ Gill, Eltalouny, Mitroga, Lilya absent for vote to Adjourn

5	Dustin	Cold-Chain Subc. proposes to develop program topic and guidelines or research on maintaining cold chain in 1st 6 hours of outage event.	On-going / 2
7	Hwang	Identify and name new Alternate #1 to MTG.RAC to replace Walid and back-up Carlos	New / 6
8	All	Look at revised position document Refrigerants and their Responsible Use to make sure heat pumps reflected properly in document – HVAC&R replaces Refrigeration & Air Conditioning	Complete / 6
9	All	Recast Ammonia position document as a White Paper – MBO #2 – Translate to other languages besides English. Very important in developing countries. Incoming member Harshal Surange volunteered to help with translation and overall effort.	On-going /6
10	Hwang	Identify a REF-CPCC member (Hon) to serve as a liaison to GAC and coordinate with our new GAC liaison Nanette Lockwood.	Complete / 7
11	Hwang	Identify and name a new Subc. Chair for the HVAC Subc. to replace Walid. – Steve Kujak new HVAC Subc. Chair	Complete / 7

ACTION ITEMS – Spring 2020 – Meeting

No.	Responsibility	Action Item	Status
1	(All Sub. Chairs and Staff)	Select meeting start times, meeting duration, and days to poll for a subcommittee web meeting in April or May for each of the eight REF-CPCC Subcommittees and notify Mike Vaughn so he can generate the meeting polls and set-up the web meeting in order to be able to report at REF-CPCC Virtual Annual meeting 4/21/20 – HVAC Subc. meeting 5/1/20 – Awards Subc. meeting 5/7/20 – Research Subc. meeting 5/13/20 - Research Subc. meeting 5/29/20 – Awards Subc. meeting 6/1/20 – Cold-Chain Subc. meeting 6/11/20 – Position Doc. Subc. meeting 6/16/20 - Bi-Annual Report Subc. meeting – 7 members – purpose – scope and outline developed – need volunteers from outside USA. 6/22/20 – Position Document Subc. meeting No Program Subc. meeting was held due to other duties of chair regarding WRD planning.	Complete
2	Gill	Send two Program Subcommittee Objectives for this year to staff for Ref-CPCC MBOs spreadsheet	On-going
3	Nawaz	Explore with Research Subc. the following focus areas for possible REF-CPCC research projects: Health & Wellness, Food Safety, Loss, and Waste	On-going

4	Maston	Find out additional information on why the Comfort Cooling Award was cancelled by Members Council and the Board in Orlando. <u>Answer:</u> 5 Consecutive years without a nomination.	Complete
5	Ayman/Staff	Investigate why Donald A. Siller Refrigeration Award is administered by Chapter Technology Transfer Committee (CTTC) and not REF-CPCC. <u>Answer:</u> This award recognizes exceptional performance by a <u>Chapter Refrigeration Chair</u> for planning activities and providing technology transfer about refrigeration to chapters.	Complete
6	Maston/Staff	Check to see if Rules of the Board could be modified to allow most recent Past Chair to be a non-voting consultant position on SY 20-21 roster or if Society budget constraints will not allow for this change now. <u>Answer:</u> Budget constraints prevent this right now.	Complete
7	Staff	Add to agenda for next REF-CPCC meeting (Virtual Annual) a discussion on how to formalize permanent representatives on REF-CPCC for International bodies. <u>Answer:</u> Budget constraints prevent this right now.	Complete
8	Staff	Set-up web meeting for the 1 st week May for Rajan, Yunho, Martin, Didier & Sarah to discuss Organizational representatives on REF-CPCC. <u>Answer:</u> same as AI #7	Complete
9	All Members	Help to find speakers for World Refrigeration Day (WRD) webinar if possible & help promote webinar. 90-minute webinar with 5-7 speakers. Ayman heading webinar Subc. so, pass-on possible speaker names to him. https://www.ashrae.org/about/news/2020/ashrae-supports-world-refrigeration-day-2020	Complete
10	Staff	Add Bill Walter and Adan Ayub to R in ASHRAE Subc. and share R-ASHRAE webpage link with R in ASHRAE Subc. Link: https://www.ashrae.org/technical-resources/refrigeration	Complete
11	Staff	Double check subcommittee rosters to make sure they have been updated to include all new volunteers from Orlando meeting	Complete
12	Staff	Add latest TC Scopes document to REF-CPCC Basecamp	Complete
13	Gill/Staff	Send e-mail request to full REF-CPCC roster and meeting attendees asking for program ideas for 2021 Winter meeting	Complete
14	Chair/Gill/Ayman/IIAR rep.	Form small working group to implement recommendation to add Ammonia to Refrigerants and Responsible Use Position Document. Doug Scott volunteered help find IIAR Rep. May 2020 Target end date for this effort.	Complete
15	Gill/ Staff	Send information on Real Zero Refrigerant Training – Free online training course – open to all - send to all.	Complete

16	Hon	Work with the Government Affairs Committee Chair to establish Liaisons between REF-CPCC and GAC. Nanette Lockwood is our new GAC liaison. We now need to identify a liaison from REF-CPCC to GAC.	Complete
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CARRYOVER ACTION ITEMS – Winter 2020 – Meeting

No.	Responsibility	Action Item	Status
2	Chair/Staff	Need better communication method to Regions. Invite all seven current Regional Refrigeration Vice Chairs (RVCs) to next REF-CPCC web meeting.	On-going
4	Chair/Gill/Staff	Investigate if REF-CPCC leadership and Program Subc. can help identify Distinguished Lecturer (DL) topics & speakers and then take up with CTTC for approval. https://www.ashrae.org/communities/chapters/distinguished-lecturers	On-going Chair requested help from all members at fall 2020 meeting
6	Ayman/Staff	Re-educate Society on new scope for REF-CPCC with help from ASHRAE Marketing and R in ASHRAE webpage.	On-going
8	R in ASHRAE Subc.	R in ASHRAE subc. create regular communication document targeted to RVCs. Also, develop training session material for RVCs at CRCs – Invite to attend REF-CPCC meetings too.	On-going

LIST OF ACRONYMS

AI	Action Item	MORTS	Manager of Research & Technical Services
ASHRAE	American Society of Heating, Refrigerating and Air-conditioning Engineers	MOU	Memorandum of Understanding
BOD	Board of Directors	MTG	Multidisciplinary Task Group
CNV	Chair Not Voting	OPS	TechC Operations Subcommittee
CTTC	Chapter Technology Transfer Committee	PAOE	Presidential Award of Excellence
DRSC	TechC Document Review Subcommittee	PD	Position Document
Ex-O	Ex-Officio	RatRU	Refrigerants and their Responsible Use
GCCA	Global Cold Chain Alliance	REF-CPCC	Refrigeration Technology Committee for Comfort, Process, and Cold-Chain
IIR	International Institute of Refrigeration	SY	Society Year
IoR	Institute of Refrigeration	TAC	Technical Activities Committee
MBO	Management by Objectives	TC	Technical Committee
MOP	Manual of Procedures	UNEP	United Nations Environment Programme

**Refrigeration Committee Technology Committee
for
Comfort, Process, and Cold-Chain
(REF-CPCC)
Spring Meeting,
Thursday October 1st, 2020
Web Meeting**

1. CALL TO ORDER

Chair Yunho Hwang called the meeting to order at 9:00 AM ET. Members and guests introduced themselves. Staff confirmed quorum.

2. ASHRAE CODE OF ETHICS COMMITMENT

In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, inclusiveness and respect for others, which exemplify our core values of excellence, commitment, integrity, collaboration, volunteerism and diversity, and we shall avoid all real or perceived conflicts of interests.

(Code of Ethics: <https://www.ashrae.org/about/governance/code-of-ethics>)

(Core Values: <https://www.ashrae.org/about/ashrae-s-core-values>)

3. REVIEW OF AGENDA

Program Subcommittee Objectives for this year still need to be defined for this year in committee MBOs.

How can REF-CPCC contribute in the COVID 19 battle? Ayman reminded committee of the UNEA food lost & waste – cold chain connection to safety. See Orlando Minutes Attachment G - “Promoting Sustainable Practices and Innovative Solutions for Curbing Food Loss and Waste” for more information.

Charles Hon provide a short update on GAC and our new Liaison from GAC - Nannette Lockwood

MOTION #1 – Carry over from 2020 Annual meeting

It was moved (AE) and seconded (YH)

- (1) Meeting agenda be modified to include a discussion on the TC 1.6 (Terminology) effort titled *Harmonizing Technical Terminology to Create Understanding*.

MOTION #1 PASSED: 7-0-1-4 (12) CNV AE/YH – This agenda item will carry-over to 2021 Winter meeting agenda since we ran out of meeting time.

4. MINUTES

MOTION #2

It was moved (MD) and seconded (SK) that,

- (2) the minutes from the 2020 REF-CPCC Annual Meeting be approved.

BACKGROUND: Minutes were distributed via email Sep. 21, 2020

MOTION #2 PASSED: 7-0-1-4 (12), CNV MD/SK

5. STANDING REPRESENTATIVES FROM IIR & UNEP ON REF-CPCC ROSTER

MOTION #3

It was moved (MD) and seconded (SK) that,

- (3) The Refrigeration Technology Committee for – Comfort – Process and Cold-Chain hereby recommends that a voting representative from IIR & UNEP be included each year on the REF-CPCC roster

BACKGROUND: No Fiscal impact. Total REF-CPCC membership will remain at 12 voting members.

MOTION #3 PASSED: 7-0-1-4 (12) CNV MD/SK

6. CHAIR'S REPORT – HWANG

The primary purpose of the REF-CPCC fall meeting was to continue to take steps to launch the following eight new subcommittees for REF-CPCC by helping them to make plans for their fall 2020 web meetings.

New REF-CPCC Subcommittee Structure:

1. Program - Chair: **Stephen Gill** – Members: Coulomb, Kazachki, Ravi, Miyara, Hwang
2. Research – Chair: **Yunho Hwang** – Members: Ayub, Nawaz, Chakroun
3. HVAC – Chair: **Walid Chakroun**– Members: Hourahan, Abdelaziz, Kujak
4. Cold Chain – Chair: **Dustin Lilya** – Members: Ayub, Hon, Scott
5. R in ASHRAE – Chair: **Didier Coulomb** – Members: Rajendran, Selbert, Walter, Ayub
6. Refrigeration Technology Report – Chair: **Martin Dieryckx** – Members: Rajendran, Welter, Kazachki, Zha, Ayub
7. MTG.RAC – Chair: Carlos Mitroga – Alternates: #1 Tony Welter, #2 Dustin Lilya, #3 Stephen Gill – Walid rolled-off as Alternate #1 in June.
8. Award Subcs – Briley and Garland- Chair: **Ayman Eltalouny** – Members: Dieryckx, Hon, Mitroga

Fall 2020 Subcommittee Meeting Dates & Summary Notes:

4/21/20 – HVAC Subc. meeting – 3 members total

Meeting Notes: Need to identify partner groups. Work w/CEC and other organizations to disseminate information on HVAC workshops, seminars, and conferences to partners.

2020 Annual – AI #2 (Staff) provided list of all TCs related to HVAC: TCs 4.3, 5.1, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3, 6.5, 6.8, 6.9, 8.3, 8.7, 8.9, 8.10, 8.11

Met 9/16/20– Awards Subc. meeting – 4 members total

2020 Fall – (Ayman) Award Subc. met in September to combine the Milt Garland and Comfort Cooling awards into one new award named the *Milton W. Garland Commemorative Comfort – Process – Cold Chain - Award for Project Excellence*. A REF-CPCC letter ballot is now underway to approve this proposed new award. If approved by the ASHRAE Board, we will evaluate the project application that we received from the Hong Kong Chapter last May using this new award description, submission form, and scoring form. The Awards Subc. will also recommend a SY 20-21 recipient for the George Briley ASHRAE Journal Article Award for consideration by REF-CPCC also via letter ballot vote this fall.

Meeting in late Oct. 2020 – Research Subc. meeting – 3 members total

See Orlando Minutes Attachment G - “Promoting Sustainable Practices and Innovative Solutions for Curbing Food Loss and Waste” for more information.

2020 Annual – AI #4 (Nawaz) has volunteered to chair the REF-CPCC Research Subc. in place of Chair Yunho. TC 6.8, 8.4, and 8.6 have also agreed to work with us. This group of TCs has already brainstormed 15 research topics to explore further that they will share with us.

Met 10/8/20 – Cold-Chain Subc. meeting – 7 members total

2020 Fall – AI #5 (Dustin) – Cold-Chain Subc. proposes to develop program topic and guidelines or research on maintaining cold-chain in 1st 6 hours of outage event.

Met 10/14/20 - Bi-Annual Report Subc. meeting – 7 members – purpose – scope and outline developed – need volunteers from outside USA.

Working to propose an alternate definition for “Refrigeration” for consideration by REF-CPCC and others before proceeding with the Bi-Annual Report. Purpose of the report is to show what Refrigeration technologies currently exist worldwide. The publishing frequency of this report be every 2-years. Target page count for the report is 30 pages.

2020 Annual – AI #6 (Staff) – Include report from Bi-Annual Ref. Tech Report Subc. in meeting minutes

Below are initial notes from today's Bi-Annual Ref. Tech Report subcommittee meeting.

Attendees: Martin, Rajan, Alaa, Tony, Georgi.

Absent: Shitong, Adnan

The agenda is as follows:

- Opening of the meeting by the chair.
- Introducing each other
- Background of the subcommittee by the chair
- Draft purpose of the report
- Distribution of the regions and product groups
- Preparations for next meeting.
- Closing of the meeting

Key Points:

- No results were found when Google was searched for Refrigeration Technology Reports.
- Purpose of Subc. is to identify and explain various refrigeration circuit technologies from a global/regional perspective.
- Not a report to be used for R&D or research.
- Current ASHRAE Refrigeration HDBK volume not a good source for non-USA technology – not even state-of the art USA technology in some cases.
- Sister organizations (IIAR, IOR, etc.) have no such information currently.
- Current Subc. lacks members from Japan or China.
- Report will only mention publicly available information or information a company has given us permission to use in the report from various regions around the world.
- Evaluate after 1 year if process should continue.
- Focus of report on Refrigeration Circuits only!
- May need expertise from outside ASHRAE

Action Items:

- Find out why other organizations such as AHRI, IOR, etc. have not done such as report before – should we try to find out before we proceed further? ALL
- Formulate draft proposal for report (Purpose, Scope, Skeleton Outline) in MS-Word and send to full Subc. – Martin
- Review current HDBK volumes on what information is currently missing related to Refrigeration Circuits – Gap analysis of Technology that can be passed on to TCs – ALL
- All think about how we can best report gap/analysis results to TCs – ALL
- Attempt to recruit new Subc. members from Japan & China – All pass names & contact info. suggestions on to Mike so he can follow-up with suggested members.
- Next meeting will be in 2 months – Martin to provide poll dates to Mike so Doodle poll can be generated.

2020 Annual – AI #7 (Hwang) Name new Alternate #1 to replace Walid and back-up Carlos – MTG.RAC

No Program Subc. meeting was held due to other duties of Subc. Chair regarding WRD planning.

7. BOD Ex-Officio REPORT – Conlon

Board ExO Sarah Maston gave a PowerPoint Presentation on the 2020 Virtual Conference, upcoming topical conferences, the new leadership for the next Society year, as well as made a plea for committee member nominations for the next Society year, which are due to your Board ExO before mid-February 2021. More information on this presentation can be found in **ATTACHMENT C**.

8. SUBCOMMITTEE SPRING MEETINGS

SPR20 AI # 1 (All Sub. Chairs and Staff) – Select meeting start times, meeting duration, and days to poll for a subcommittee web meeting in April or May for each of the eight REF-CPCC Subcommittees and notify Mike Vaughn so he can generate the meeting polls and set-up the web meeting in order to be able to report at REF-CPCC Virtual Annual meeting – Status: **Complete**

1. Staff update on New Subcommittees:

See **ATTACHMENT A** below for further information on each Subcommittee and current membership of each. The subcommittee information now includes a table showing the availability of subcommittee members based upon their home time zone that can be used to help poll for a subcommittee meeting.

2. MTG RAC Plant Assessment Guide

REF-CPCC joined the new MTG.RAC Plant Assessment Guide and named Carlos Mitroga as voting member and Walid Chakroun as Alternate #1. Both have since been added to the MTG.RAC roster and should be getting MTG meeting information now. Three additional Alternates (Welter, Lilya, and Gill) have been named since the Orlando meeting.

3. Program Subcommittee

Subcommittee Chair: Stephen Gill reported that February 10th is the deadline for Austin Conference program submissions. The topic of recruiting more distinguished lecturers on Refrigeration Technology topics was also discussed.

4. Research Subcommittee

Subcommittee Chair: Yunho Hwang reported that committee does not have any active research projects underway or in development yet but mentioned that the next generation compressor might be based on electro-chemical compression if we wish to explore this technology further. Goal is to create collaborative research program with TCs. Adnan Ayub, Walid Chakroun, and Kashif Nawaz volunteered to join the subc. during meeting.

SPR20 AI #3 (Hwang) - Explore with Research Subc. the following focus areas for possible REF-CPCC research projects: Health & Wellness, Food Safety, Loss, and Waste

5. Awards Subcommittee

Subcommittee Chair: Ayman Eltalouny reported SY18-19 Briley Award was presented at this meeting to Dr. Abu-Heiba of Oak Ridge National lab for his ASHRAE Journal article *Setting Charge Limits for Flammable Refrigerants* published in the July 2018 (Vol. 60 (7)) edition of the ASHRAE Journal.

The subcommittee also reported that they conducted a 5-year review of the Comfort Cooling Award and Milt Garland Award at the request of Honors and Award Committee. No nominations for the Milt Garland award or the Comfort Cooling Award were submitted in the last 4 years, but the subc. recommended that both awards continue.

Note: Staff learned at the Wednesday Board meeting in Orlando that Honors and Awards Committee recommended to the Board through Members Council that the Comfort Cooling Award should be dropped due to low interest. The Board approved H&A's recommendation.

We now have as pass through awards from Honors & Awards Committee for the Briley Award and the Milt Garland Award to select.

6. Refrigeration Technology Report

Subcommittee Chair - Martin Dieryckx reported that Goal is to create every 2 years an update on refrigeration technology on the global level and to identify what technology is most important or promising now. Information from this report will also be shared with the TCs to help keep the Refrigeration Handbook Volume up to date and relevant to today's engineers. Target member for subcommittee is a manager of technical issues based anywhere in the world for broad international representation. Focus will not be on new refrigerants but on new and established technologies. Result from this subcommittee could possibly be the basis for an ASHRAE Tech Hour webinar presentation.

7. Cold-Chain

Subcommittee Chair – Dustin Lilya reported that a new application for cold chain technology is concrete cooling. Doug Scott, Adnan Ayub, Charlie Hon, volunteered to join the subc. It was also suggested that IIR and IIAR should be encouraged to join the subc. also

8. HVAC

Subcommittee Chair – Walid Chakroun reported that he plans to recruit at least three members and is finalizing subcommittee scope statement. First goal will be document latest technology related to heat pumps. Glenn Hourahan, Omar Abdelaziz and Steve Kujak volunteered to join the Subcommittee during the meeting. Walid also suggested that we should ask TechC to look at all information we have to help control Corona virus out-break and send to all regions.

9. POSITION DOCUMENT UPDATES REPORTS

A. Refrigerants and Responsible Use PD

Implement recommendation to add ammonia to Refrigerants and their responsible use PD Working Group members: Rajan, Steven Gill, IIAR representative identified by Doug Scott is Dave Rhule.

Scheduled to expire now June 21, 2021. April 1 or May Target end date for this effort.

2020 Annual – AI #8 (All) – Look at revised position document Refrigerants and their Responsible Use to make sure heat pumps reflected properly in document – HVAC&R replaces Refrigeration & Air Conditioning

MOTION #4

It was moved (CH) and seconded (DL) that, Revised ASHRAE Position Document titled *ASHRAE Position Document on Refrigerants and Their Responsible Use* – be passed on to Technology Council for consideration after the text “Refrigeration & Air-Conditioning” is replaced throughout the document with the text “HVAC&R”

MOTION #4 Passed 9-0-1-2⁴ (12) CNV CH/DL

B. Ammonia as a refrigerant PD – expired Feb. 1, 2020
2020 Annual - AI#9 (All) - Recast Ammonia position document as a White Paper – MBO #2 – Translate to other languages besides English. Very important in developing countries. Incoming member Harshal Surange volunteered to help with translation and overall effort.

10. OTHER INFORMATION – WORLD REFRIGERATION DAY

World Refrigeration Day is on Friday June 26, 2020 this summer
<https://www.ashrae.org/about/news/2020/ashrae-supports-world-refrigeration-day-2020>

Thank you to all REF-CPCC members that helped with this effort!

11. STRATEGIC ISSUES

SPR20 AI #16 (Hon) – Work with the Government Affairs Committee Chair (Walid now) to establish Liaisons between with REF-CPCC and GAC. – Complete: Nanette Lockwood is our new Liaison to GAC

2020 Annual – AI #10 (Hwang) – Identify a REF-CPCC member (Hon?) to serve as a liaison to GAC and coordinate with our new GAC liaison Nanette Lockwood.

2020 Annual – AI #11 (Hwang) - Identify and name a new Subc. Chair for the HVAC Subc. to replace Walid.

12. VICE CHAIR’S REPORT

Vice Chair Hwang recognized and thanked the Chair (Rajan) and the other members (Walid, Stephen, and Sarah), who are all rolling off REF-CPCC after this meeting for their service. He also outlined briefly his four MBOs for the coming Society year. Two MBOs carry-over from this Society year and two MBOs are new.

13. NEXT MEETING – Fall Web Meeting in September or October

14. ADJOURNMENT

MOTION #5

It was moved (MD) and seconded by (YH) that, the meeting adjourn

MOTION #5 PASSED: 9-0-1-2 (12), CNV MD/YH

ATTACHMENT A

Refrigeration Technology Committee for Comfort, Process, and Cold-Chain (REF-CPCC)

REF-CPCC Awards Subcommittee			
Scope:	REF-CPCC Awards Subcommittee will develop award recipient recommendations each year for the Briley and Garland awards and possibly develop new refrigeration related awards.		
Chair:	Ayman Eltalouny – ayman.eltalouny@unep.org – Ph. 0097317825110		
SY 19-20 Objectives:			
Objective #1	Ensure wider engagement of Ref. Committee members in the process of judging the Briley and Garland Awards		
Objective #2	Map existing ASHRAE awards and recommend other award categories in relation to the scope of the Refrigeration Committee		
Subc. Members:			
Name	Email	Phone Number	Affiliation
Ayman Eltalouny, Chair	ayman.eltalouny@unep.org	0097317825110	UNEP
Martin Dieryckx	dieryckx.m@daikineurope.com	477663625	Daikin
Charles Hon	chon@truemfg.com	(636) 240-2400x1383	True Mfg.
Carlos Mitroga	cmitroga@danfoss.com	56228978811	Danfoss

AWARDS Subcommittee Meeting Start Time Options based upon home base locations of members:

Ayman	Martin	Charlie	Carlos	TBD	TBD	TBD
4pm	3pm	8am	10am			
5pm	4pm	9am	11am			
6pm	5pm	10am	12pm			
7pm	6pm	11am	1pm			

Refrigeration Technology Committee for Comfort, Process, and Cold-Chain (REF-CPCC)

Cold Chain Subcommittee

Draft Scope:	REF-CPCC Cold Chain Subcommittee will research and study current topics related to temperature-controlled supply chain and disseminate this new information to a broader audience through collaboration with the Program, Research subcommittees or through other organizations.		
Chair:	Dustin Lilya - dlilya@dcengineering.net – Ph. (208) 288-2181		
SY 19-20 Objectives:			
Objective #1	Recruit and form the Subcommittee membership and define roles responsibilities for the committee members.		
Objective #2	Reach out to cold chain community and collect information on relevant current topics of interest <u>Food Safety and Food Security</u>. Communicate the relevant topics to the other stakeholders (Research and Program Committees)		
Subc. Members:			
Name	Email	Phone Number	Affiliation
Dustin Lilya, Chair	dlilya@dcengineering.net	(208) 288-2181	DC Engineering
Adnan Ayub	adnan@iso-therm.com	(817) 472-9922	Isotherm Inc.
Charles Hon	chon@truemfg.com	(636) 240-2400x1383	True Mfg.
Doug Scott	dscott@vacomtech.com	(909) 374-1113	VaCom Technologies
Alaa Olama	alaaolama@gmail.com	+201006099950	Montreal Protocol
Michael Saunders	Mike.saunders@emerson.com	937-726-4928	Emerson
John Gallaher	John.gallaher2@gmail.com	(828) 577-1122	ASHRAE Member
Harshal Surange	harshalsurange@gmail.com	937-706-48458	ACR Project Consultants
Ayman Eltalouny	ayman.eltalouny@unep.org	0097317825110	UNEP

COLD CHAIN Subcommittee Meeting Start Time Options based upon home base locations of members:

Doug	Dustin	Adnan	Charlie	MikeS.	JohnG.	Alaa	Ayman	Harshal
7am	8am	9am	9am	10am	10am	4pm	4pm	7:30pm
8am	9am	10am	10am	11am	11am	5pm	6pm	8:30pm
9am	10am	11am	11am	12pm	12pm	6pm	7pm	9:30pm
10am	11am	12pm	12pm	1pm	1pm	7pm	8pm	10:30pm

Refrigeration Technology Committee for Comfort, Process, and Cold-Chain (REF-CPCC)

HVAC Subcommittee

Scope:	REF-CPCC Comfort Cooling and Heating Subcommittee will research and study current topics related to comfort cooling in the refrigeration spectrum and disseminate this information to a broader audience through collaboration with the Program, Research subcommittees or through other organizations.		
Chair:	New Chair needed now that Walid has rolled off REF-CPCC		
SY 19-20 Objectives:			
Objective #1	Identify councils, committees, subcommittees and other entities within ASHRAE that may help meeting the scope of the HVAC subcommittee		
Objective #2	Work with ASHRAE CEC and other organizations to document and disseminate HVAC workshops, seminars and conferences related to comfort cooling.		
Subc. Members:			
Name	Email	Phone Number	Affiliation
Steve Kujak, Chair	skujak@tranetechnologies.com	(608) 787-3766	Trane
Glenn Hourahan	ghoura@comcast.net	(703) 625-2522	Hourahan Consulting, LLC
Omar Abdelaziz	omar.abdel.aziz@gmail.com	(865)387-0725	Oak Ridge National Lab

HVAC Subcommittee Meeting Start Time Options based upon home base locations of members:

Steve	Glenn	Omar	TBD	TBD
7am	8am	2pm		
8am	9am	3pm		
9am	10am	4pm		
10am	11am	5pm		

Refrigeration Technology Committee for Comfort, Process, and Cold-Chain (REF-CPCC)

Program Subcommittee

Scope:	REF-CPPC Program Subcommittee will develop technical programs of various types (Technical Paper Sessions, Conference Paper Sessions, Seminars, Debates, Forums, Panels, and workshops) for the REF-HRAC committee that can be presented at Society meetings or at other organizations conferences. The subcommittee will also work with other Society committees and other organizations to co-sponsor programs that jointly benefit both committees or organizations.		
Chair:	Steven Gill - ASHRAE@stephencgill.com – PH: 1949850651		
SY 19-20 Objectives:			
Objective #1	TBD		
Objective #2	TBD		
Subc. Members:			
Name	Email	Phone Number	Affiliation
Steven Gill, Chair	ASHRAE@stephencgill.com	1949850651	Stephen Gill Associates
Didier Coulomb	d.coulomb@iifir.org	33142273235	IIFIR
Dr. Georgi Kazachki	kazachki@comcast.net	(678)576-7135	CRYOTHERM Consulting
Gurunarayana Ravi	gurunarayana.ravi@lennoxind.com	(281)907-2901	Lennox
Prof. Akio Miyara	miyara@me.saga-u.ac.jp	81952288623	
Prof. Yunho Hwang	yhhwang@umd.edu	(301) 405-5247	U. Maryland

Program Subcommittee Meeting Start Time Options based upon home base locations of members:

Didier	Steven	Georgi	Yunho	Ravi	Akio	TBD
2pm	1pm	8am	8am	7am	9pm	
3pm	2pm	9am	9am	8am	10pm	
4pm	3pm	10am	10am	9am	11pm	
5pm	4pm	11am	11am	10am	12pm	

Refrigeration Technology Committee for Comfort, Process, and Cold-Chain (REF-CPCC)

Research Subcommittee

Scope:	REF-CPCC Research Subcommittee will develop research projects for bid that support and advance the scope of REF-HRAC (via RTARs, WS, TRPs, and RPs) The subcommittee will also work with other Society committees and outside organizations to co-sponsor research projects that jointly benefit both committees or organizations.		
Chair:	Kashif Nawaz – nawazk@ornl.gov – Ph. 865-574-9338		
SY 19-20 Objectives:			
Objective #1	New! - Develop list of suggested refrigeration research topics for consideration by the new Research Advisory Panel (RAP) so that they can be included in new Research Strategic Plan for Society. Recruit Research Subcommittee members, brainstorm research topics, and develop RTARs		
Objective #2	Reach-out to specific TC research subcommittee chairs and work towards developing cooperative research program.		
Subc. Members:			
Name	Email	Phone Number	Affiliation
Kashif Nawaz, Chair	nawazk@ornl.gov	(865) 574-9338	DOE- ORNL
Yunho Hwang	yhhwang@umd.edu	(301) 405-2025	U. Maryland
Adnan Ayub	adnan@iso-therm.com	(817) 472-9922	Isotherm Inc.

Research Subcommittee Meeting Start Time Options based upon home base locations of members:

Yunho	Kashif	Adnan	TBD	TBD	TBD
8 am	8 am	7 am			
9 am	9 am	8 am			
10 am	10 am	9 am			

Research Topic Ideas:

1. Refrigerant Leakage Study:
 - a. Evaluate the HVAC system performance degradation due to refrigerant leaks.
 - b. A comprehensive study on the HVAC components that further contribute to leakages
 - c. Determination and analysis specific improvements that can reduce specific leakages within the vapor-compression cycle.
2. Other Ideas
 - a. Thermal performance prediction and analysis on the economized vapor injection air-source heat pump in hot climate region of Middle East
 - b. Application characteristics of variable refrigerant flow heat pump system with vapor injection in severe hot region.
 - c. Exergo-economic analysis and optimization of two-stage vapor injected system for cooling applications.
 - d. Charge-sensitive modeling of vapor compression systems for off-design performance simulation
 - e. Rooftop air-conditioning unit performance improvement using refrigerant circuitry optimization.
 - f. Investigation of Nano-lubricants Applied to Residential Air-Conditioning System.

Refrigeration Technology Committee for Comfort, Process, and Cold-Chain (REF-CPCC)

R in ASHRAE Subcommittee

Scope:	REF-CPCC R in ASHRAE Subcommittee will be responsible for maintaining the “R in ASHRAE” web page on the ASHRAE website and with developing new content for this webpage on a regular basis.		
Chair:	Didier Coulomb – d.coulomb@iifiir.org – Ph. 33142273235		
SY 19-20 Objectives:			
Objective #1	Identifying ASHRAE technical committees involved in refrigeration issues and their activities		
Objective #2	Identifying ASHRAE technical committees involved in refrigeration issues and their activities		
Subc. Members:			
Name	Email	Phone Number	Affiliation
Didier Coulomb, Chair	d.coulomb@iifiir.org	33142273235	Intl. Institute of Refrigeration
Rajan Rajendran	Rajan.Rajendran@emerson.com	(937) 726-0620	Emerson
Rachel Selbert	rachel.selbert@icf.com	(202) 791-8879	EPA/ENERGY STAR
Bill Walter	Bill.Walter@carrier.com	(315) 657-7407	Carrier
Adnan Ayub	adnan@iso-therm.com	(817) 472-9922	Isotherm Inc.

R in ASHRAE Subcommittee Meeting Start Time Options based upon home base locations of members:

Didier	Rachel	Bill	Rajan	Adnan	TBD
1pm	7am	7am	7am	6am	
2pm	8am	8am	8am	7am	
3pm	9am	9am	9am	8am	
4pm	10am	10am	10am	9am	

Refrigeration Technology Committee for Comfort, Process, and Cold-Chain

(REF-CPCC)

Refrigeration Technology Bi-Annual Report Subcommittee			
Scope:	REF-CPCC Bi-Annual Refrigeration Technology Report Subcommittee will develop every other year the bi-annual Refrigeration Technology Report for publication and distribution.		
Chair:	Martin Dieryckx - Dieryckx.m@daikineurope.com – Ph. 0477663625		
SY 19-20 Objectives:			
Objective #1	Define the scope and basic structure of the bi-annual report		
Objective #2	Organize the required membership of the subcommittee in order to prepare the report in SY20-22		
Subc. Members:			
Name	Email	Phone Number	Affiliation
Martin Dieryckx, Chair	Dieryckx.m@daikineurope.com	0477663625	Daikin
Rajan Rajendran	Rajan.Rajendran@emerson.com	(937) 726-0620	Emerson
Tony Welter	tony.welter@hendersonengineers.com	(913) 742-5484	Henderson Engineers
Georgi Kazachki	kazachki@comcast.net	(678)576-7135	CRYOTHERM Consulting
Shitong Zha	shitongzha@gmail.com	(470) 328-9018	
Adnan Ayub	adnan@iso-therm.com	(817) 472-9922	Isotherm Inc.

Refrigeration Technology Bi-Annual Report Subcommittee Meeting Start Time Options based upon home base locations of members:

Martin	Rajan	Georgi	Shitong	Adnan	Tony
2pm	8am	8am	8am	7am	7am
3pm	9am	9am	9am	8am	8am
4pm	10am	10am	10am	9am	9am
5pm	11am	11am	11am	10am	10am

Refrigeration Technology Committee for Comfort, Process, and Cold-Chain

(REF-CPCC)

Refrigeration Representatives to MTG.RAC			
Scope:	The MTG will coordinate and oversee the creation of an ASHRAE/UNEP Guide for Refrigeration and Air-Conditioning (RAC) Plant Assessments. The Guide aims to be an international reference for the safe and sustainable operation and maintenance of air-conditioning and refrigeration plants, with special focus on developing markets. The Guide is to form the basis of tools that will verify compliance to recommended practices that can be verified through a point-based qualification or verification scheme. The work will be a cooperative effort with United Nations Environment due to the critical need for such guidance in the developing world with availability of UNEP funding to offset authoring expenses.		
REF-CPCC Voting Representative	Carlos Alberto Mitroga - cmitroga@danfoss.com - 541147564100		
SY 19-20 Objectives:			
Objective #1	Support the MTG.RAC in the development of Guide for Refrigeration and Air-Conditioning (RAC) Plant Assessments		
Objective #2	Report back regularly to REF-CPCC on progress made on the guide and solicit assistance from REF-CPCC members as required to help complete the Guide in a timely fashion.		
Alternate Members			
Name	Email	Phone Number	Affiliation
Alt. #1 Tony Welter	tony.welter@hei-eng.com		
Alt. #2 Dustin Lilya	dlilya@dcengineering.net	208-288-2181	
Alt. #3 Stephen Gill	ASHRAE@stephengill.com	44 7970 786893	

MTG.RAC Voting Representative & Alternates Meeting Start Time Options based upon home base locations of members:

Carlos	Stephen	Tony	Dustin
9am	2pm	7am	8am
10am	3pm	8am	9am
11am	4pm	9am	10am
12pm	5pm	10am	11am

Harmonizing Technical Terminology to Create Understanding

By Art Hallstrom, P.E., BEMP, Fellow/Life Member ASHRAE

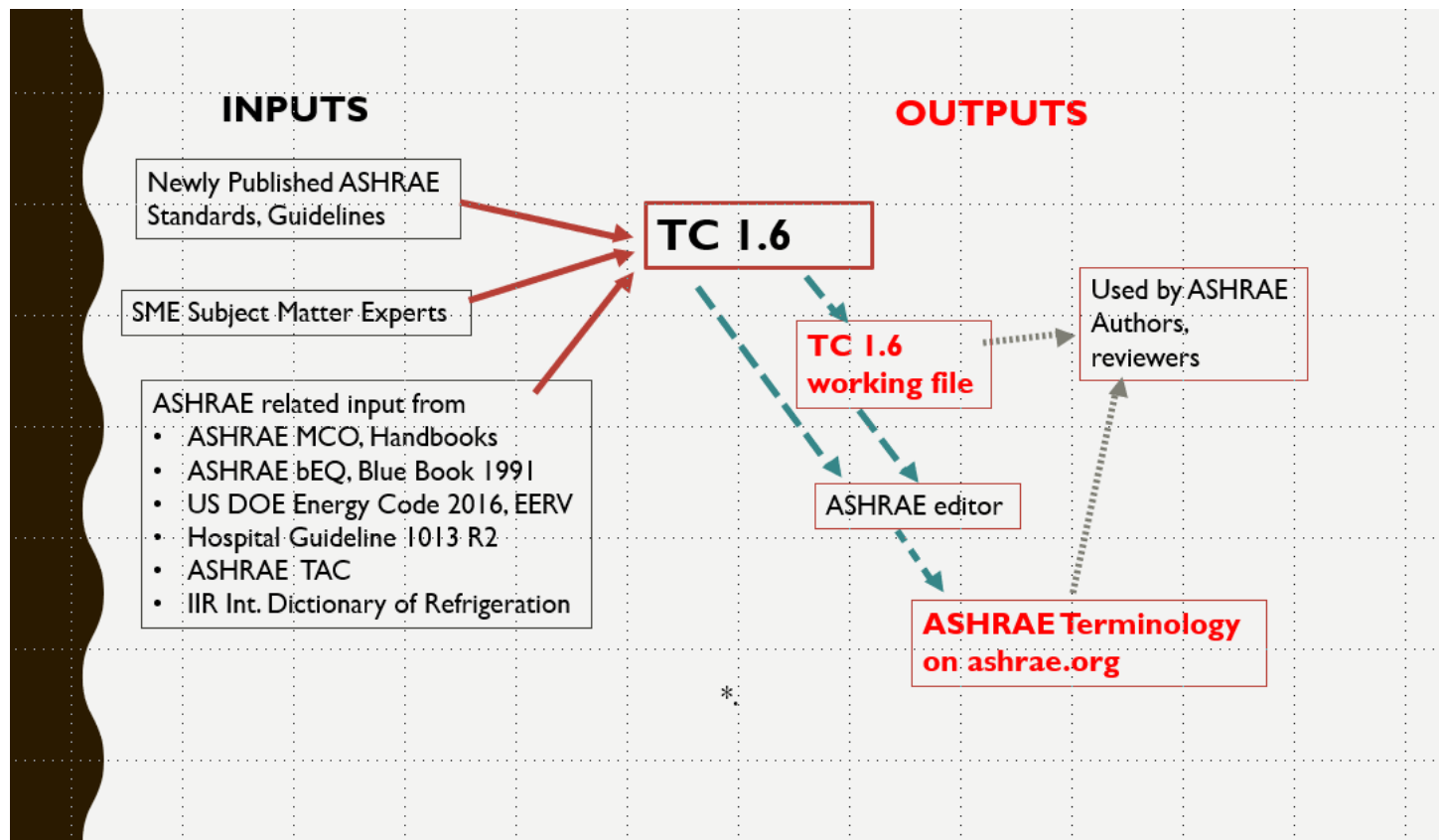
From ASHRAE Journal Newsletter, June 23, 2020

Designing high efficiency systems is challenging enough when all the team members know what each other is saying. Differences in terminology or definitions among ASHRAE and other industry partners can further inhibit ASHRAE members from effectively communicating and designing systems.

Harmonization can help. This process takes definitions for the same term from different sources and merges them into typically one definition. Harmonizing within and with organizations outside ASHRAE enhances communications. The results are generally better products and increased brand visibility for both organizations.

Last year, ASHRAE TC 1.6, Terminology, expanded its inside ASHRAE harmonization efforts by going outside ASHRAE for the first time. They worked with Refrigeration Subject Matter Experts (SMEs) from ASHRAE and the International Institute of Refrigeration (IIR)—another international HVAC&R organization—to create agreed-upon harmonized definitions for terms used by both IIR and ASHRAE. These “super-harmonization” terms increase the prominence of participating organizations.

How the Harmonization Process Worked with IIR



The first step includes ASHRAE and IIR finding the SMEs, exchanging organizational glossaries, and the refrigeration SMEs began harmonizing refrigeration-related terms.

The second step involves the ASHRAE TC 1.6 working file. This Excel file contains about 27,000 terms and definitions from 10 years of ASHRAE standard and guideline glossaries and other sources like Building EQ, *ASHRAE Handbook* volumes, Position Documents and ENERGY STAR.

Light editing is done to make the terms consistent in the working file format. For example, the term “air, standard” becomes “standard air.” Informational notes are removed. Nested terms are separated so each one is a standalone term.

Material from some external sources is not included in the working file because the source is marketing their glossary as a member benefit or is selling it. In those cases, the external source glossary is provided only to the SME’s working on the topic. For example, the ASHRAE-IIR formal harmonization agreement limits the IIR glossary use to the refrigeration SMEs.

Once the working file is ready, the last step involves ASHRAE and IIR SMEs using the working file to create super-harmonized terms. The first group of terms (cooling, refrigeration, chilling, freezing and cold chain) were approved by ASHRAE, ASHRAE Staff, IIR, TC 1.6 and added to ASHRAE Terminology webpage in 2019.

ASHRAE TC 1.6 Working File

All authors of standards, guidelines and related publications can use the TC 1.6 working file as a tool to help harmonize their glossary, thus making the publications more understandable to others. The working file is free for ASHRAE members and can be obtained by contacting [TC 1.6](#).

ASHRAE Terminology

In 2010-11, ASHRAE President Lynn Bellinger created a Presidential ad hoc committee that recommended making the printed ASHRAE Society Blue Book Glossary of industry terms into a free online resource—what is now ASHRAE Terminology. It now includes about 4,000 terms. Terms published in ASHRAE Terminology are generally more generic and harmonized than the terms found in a specific publication.

For example, seven ASHRAE standards have six different definitions for “standard barometric pressure.” In [ASHRAE Terminology](#) they have been harmonized to one definition.

ASHRAE encourages authors and reviewers to seek authoritative or cooperative sources inside and outside ASHRAE to evaluate the best possible definitions from all sources, especially where ASHRAE is not uniquely qualified to define a term. Ideally, authors should try to harmonize so fewer separate definitions exist, but not at the expense of accuracy.

ASHRAE TC 1.6 welcomes new committee members interested in being a SME or harmonizing terminology. Join [here](#).

ATTACHMENT C – SY 19-20 MBOs and SY 20-21 MBOs

REFRIGERATION TECHNOLOGY COMMITTEE FOR COMFORT, PROCESS, AND COLD-CHAIN
2019-2020 MBOs
Rajan Rajendran, Chair
Date: 8/6/2019

MBO #	MBO	Status	Date Due	Assigned To	Applicable initiative #	MBO Comments	Strategic Direction Specific Comments	Fiscal Impact
1	Reorganize subcommittee structure within REF	COMPLETE	January 2020	Rajan R; Yunho Hwang; Bill W	3	1. Program subcommittee; 2. Research subcommittee; 3. HVAC subcommittee; 4. Cold Chain subcommittee; 5. R in ASHRAE Subcommittee; 6. Refrigeration Technology Report Subcommittee	#3a, b, c	None
2	Appoint a voting Representative and Alternate member to the new MTG.RAC - RAC Plant Assessment Guide	COMPLETE	January 2020	Rajan R; Yunho Hwang	3	Join the MTG and participate to add value to ASHRAE	#3a, b, c	None
3	Take ownership of the new "R" in ASHRAE webpage for further implementation and on-going maintenance. Promote the new REF committee organization and name throughout society; put together the plan for a bi-annual report on refrigeration technology (last year's MBO)	COMPLETE	October 2019	RAC Chair and Vice Chair Yunho Hwang; Michael Vaughn; Martin D;	2 & 3	Establish a subcommittee and work closely with ASHRAE staff to continue highlighting the R in ASHRAE; expand and add new content as relevant; at mid-year, revisit the website and looking for ways to improve; develop a plan and start implementation of the bi-annual Refrigeration Technology report	#2c; #3a, b, c	None
4	Update REF MOP and Reference Manual and secure TechC approval on update to REF MOP.	COMPLETE	October 2019	Rajan R; Michael V	3	Have a draft ready for Tech Council approval in Fall 2019 meeting	#3a, b, c	None
5	Work with partnership organizations to identify and implement collaboration opportunities to promote HVAC&R	COMPLETE	June 2020	Dieter C; Ayman E	1 & 2	Starting with list of interested parties, IOR, and working with the (to be established) Research subcommittee, identify suggested research topics focused on refrigeration technology and pass on to new RAP for consideration.	#1a, #1b, #2b	None
6	Better coordinate and communicate REF activities and information transfer to ASHRAE Chapter Refrigeration Committees, possibly in coordination with and support from Section 10 TCs.	ON-GOING	June 2020	TBD	#3 & #4	Prepare short report after each Society meeting that goes to all Chapter Refrigeration Committee Chairs and highlights things such as upcoming Winter meeting Refrigeration program track, upcoming refrigeration conferences, and ASHRAE research in development, underway, or completed related to refrigeration	#3a & #3b	None
7	Create working group within REF to help develop a proposed 1st draft of work plan between ASHRAE & IAR for inclusion in new ASHRAE/IAR MOU prior to the MOU being finalized by ASHRAE and IAR	ON-GOING	June 2020	TBD	#2	Utilize technical experts within network of REF members and interested ASHRAE members that work for IAR and serve on SSPCs 15 & 34 to develop a draft work plan prior to the MOU being finalized. Build-off work this year with IAR on Refrigerants & Responsible Use PD	#2b	None

REFRIGERATION TECHNOLOGY COMMITTEE FOR COMFORT, PROCESS, AND COLD-CHAIN
 2020-2021 MBOs
 Yunho Hwang, Chair
 Date: 7/6/2020

MBO #	MBO	Status	Date Due	Assigned To	Applicable initiative #	MBO Comments	Strategic Direction Specific Comments	Fiscal Impact
1	Work with partnership organizations to identify and implement collaboration opportunities to promote HVAC&R	Continuation SY19-20 MBO #5	June 2020	Dieter C; Ayman E; Stephen G.	#1a, #1b, #2b	Starting with list of interested parties, IOR, and working with the (to be established) Research subcommittee, identify suggested research topics focused on refrigeration technology and pass on to new RAP for consideration.	On-going - New REF-CPPC Research SubC formed and first task will be to develop list of suggested research topics for consideration by the new Research Advisory Panel	None
2	Take ownership of the new "R" in ASHRAE webpage for further implementation and on-going maintenance. Promote the new REF committee organization and name throughout society; put together the plan for a bi-annual report on refrigeration technology (last year's MBO)	Continuation SY19-20 MBO #3	June 2021	Didier C; Michael V; Rajan R, Martin D;	#2c; #3a, b, c	Establish a subcommittee and work closely with ASHRAE staff to continue highlighting the R in ASHRAE; expand and add new content as relevant; at mid-year, revisit the website and looking for ways to improve; develop a plan and start implementation of the bi-annual Refrigeration Technology report	On-going - New Subcommittee formed. SubC. Chair's finalizing scope statement and defining objectives for this year. SubC. Members being recruited	None
3	Create working group within REF to help develop a proposed 1st draft of work plan between ASHRAE & IIAR for inclusion in new ASHRAE/IIAR MOU prior to the MOU being finalized by ASHRAE and IIAR	New	June 2021	TBD	#2	Utilize technical experts within network of REF members and interested ASHRAE members that work for IIAR and serve on SSPCs 15 & 34 to develop a draft work plan prior to the MOU being finalized. Build-off work this year with IIAR on Refrigerants & Responsible Use PD	On-going - REF-CPPC & IIAR working group formed, but initial focus has been on incorporating Ammonia into Refrigerants PD	None
4	Cooperate Research and Program with TCs and communicate REF activities and information to ASHRAE Chapter Refrigeration Committees.	New	June 2021	Yunho H; Stephen G.; Kashif N.	#3b	Communicate and participate in relevant TC SubC meetings; Prepare short report after each Society meeting that goes to all Chapter Refrigeration Committee Chairs including upcoming Winter meeting Refrigeration program track, upcoming refrigeration conferences, and ASHRAE research in development, underway, or completed related to refrigeration technology.	On-going - Goal is to communicate with relevant TC SubC chairs and issue the 1st REF-CPPC activity summary to Chapter Refrigeration Committees after virtual Annual meeting.	None

Goals and Initiatives for 2019-2024 Society Strategic Plan

Initiatives:

- #1 Resilient Building and Communities
- #2 Indoor Environmental Quality
- #3 Organizational Streamlining
- #4 Improve Chapter Engagement, Capacity and support

Goals:

Goal 1: Position ASHRAE as an Essential Knowledge Resource for a Sustainable, High-Performance Built Environment

#1a Position ASHRAE as an Essential Knowledge Resource for a Sustainable, High-Performance Built Environment

#1b Expand capabilities globally to create, aggregate and disseminate essential information and knowledge focusing on emerging market trends and transformative approaches

Goal 2: Maximize Member Value and Engagement

#2a Infuse enthusiasm, vitality and diversity throughout ASHRAE events and services

#2b Expand the impact of collaboration and partnerships with industry organizations, universities and government agencies

#2c Leverage technology to increase member engagement, awareness and value

Goal 3: Optimize ASHRAE's Organizational Structure to Maximize Performance

#3a Prototype and launch new approaches that will increase ASHRAE's relevance and speed to market for key offerings

#3b Optimize ASHRAE's organizational systems and structures to increase capacity, efficiency and effectiveness

#3c Cultivate industry and member philanthropy to extend ASHRAE's impact and reach

