TECHNOLOGY COUNCIL MEETING

Winter Conference, Las Vegas, NV
Wednesday, February 1, 2017

NOTE: These are not the official minutes until approved by Technology Council

Table of Contents

MAJOR MOTIONS PASSED
Winter Conference, Las Vegas, NV
Wednesday, February 1, 2017

Motion #	Description
1	That the Rule of the Board 1.201.034, *International Policy for Standards*, be revised as shown (see notes for details)
2	That items 1 through 19 below from the Standards Committee Report be approved for publication
3	That the TPS for Standard 15 *Safety Standard for Refrigeration Systems,* be revised as shown (see notes for details).
4	That the TPS for Standard 188 *Legionellosis: Risk Management for Building Water Systems,* be revised as shown (see notes for details).
5	Technology Council approve $5000 for the Residential Building Committee (RBC) budget starting in FY2017-18 to fund travel for RBC members (or designees) to attend outside conferences to promote ASHRAE residential topics and resources.
5A	That Technology Council approve $5000 for the Residential Building Committee (RBC) budget starting in FY2017-18 to fund travel for RBC members (or designees) to attend outside conferences to promote ASHRAE residential topics and resources <u>subject to approval by the President on a case by case basis.</u>
6	That Technology Council request that 6% in lieu of 4% be transferred from the Research Reserve fund for the next two years (17-18, 18-19).
8	That production and distribution of the Technology Council Members First Newsletter be terminated.
10	That Tech Council approve a maximum of $125K (100% of the $125,000 estimated budget) for the development of a Standard 100 User's Manual.
11	That Technology Council reaffirm the *Refrigerants and their Responsible Use* PD.
12	That Technology Council reaffirm the *Airborne Infectious Diseases* PD.
13	That Technology Council recommend that the Board of Directors (BOD) ExCom initiate a revision of the *Refrigerants and their Responsible Use* position document (PD).
14	That Technology Council recommend that the BOD ExCom initiate a revision of the *Airborne Infectious Diseases* PD.
15	That Technology Council recommend that the BOD ExCom initiate a revision of the *Climate Change* PD.
16	That Technology Council recommend that the BOD approve the revised *Ammonia as a Refrigerant* Position Document (PD).

17	That tentative research project 1721-TRP, *Oil Return and Retention in Unitary Split System Gas Lines with HFC and HFO Refrigerants*, be awarded to the Purdue University for a period of 24 months at a total cost to ASHRAE of $120,714.
18	That tentative research project 1734-TRP, *Reproducing a Representative Urban Atmospheric Aerosol Distribution at High Concentration in the Laboratory for Air Filter Ageing to be used in ASHRAE GPC 35P for Determining the Energy Consumption Caused by Air Filters*, be awarded to the Purdue University for a period of 24 months at a total cost to ASHRAE of $140,000.
19	That tentative research project 1785-TRP, *Experimental Validation of Refrigerant Charge Models in Coils for Residential Split Systems*, be awarded to Oklahoma State University for a period of 30 months at a total cost to ASHRAE of $139,615.

MINUTES
TECHNOLOGY COUNCIL MEETING
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Voting Members Present
Pat Graef, Chair
Ginger Scoggins, Vice Chair
Dan Int-Hout
Bill Walter
Jaap Hogeling
Ken Fulk
Charlie Culp
John Harrod
Byron Jones
Mark Modera
Doug Reindl

Non-Voting Members Present
Mike Bilderbeck
Rita Harrold
Art Giesler
Wane Baker
Karim Amrane
Max Sherman
Chris Mathis

Absent
Tom Lawrence VM
Kelley Cramm NVM
Steve Emmerich NVM
Kishor Khankari NVM
Lan Chi Nguyen Weekes
Nicholas Shockley

Guests
Mark Fly, AAON
Adam Parker, Pace
Alexis Gagnon, EVAP-Tech MTC
Mike Woodford, AHRI
Leslie Johnson, Mazzetti
Scott Wayland,
Steve Hammerling, AMORTS
Susan LeBlanc, Standards Admin
Lilas Pratt, MOSP
Stephanie Reiniche, MOS
Jim Scarborough, Manager - Grassroots Government Affairs
Mike Vaughn, MORTS

ASHRAE Staff
DD Latham, Admin. Asst.
Claire Ramspeck, DOT

1. CALL TO ORDER

Vice Chair Ginger Scoggins called the meeting to order at 9:05 a.m. Ms. Scoggins asked for any changes to the agenda. There being none, the agenda was accepted as presented.

Secretary's Note: Quorum was met with 10 voting members, including vice chair. Chair, Pat Graef joined the meeting at 9:25 a.m.

2. STANDING COMMITTEE REPORTS

A. STANDARDS *02A*

Information items were reviewed, the motions listed below were presented. Report attached.

It was moved by Bill Walter and seconded that:

M1 The Rule of the Board 1.201.034, *International Policy for Standards*, be revised as shown:

1.201.034 International Policy for Standards

1.201.034.1 ASHRAE is a technical society whose mission is to advance the arts and sciences of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world.

1.201.034.2 The ASHRAE Board of Directors adopted its Strategic Plan in March 2006 that contains a direction that states, "ASHRAE will be a global leader in the HVAC&R community." A strategy within this direction is to "develop products and services to meet emerging needs of the global market."

1.201.034.3 Internationally recognized standards and their adoption and utilization play an increasingly crucial role in the HVAC&R industry. The Society recognizes their importance to its membership by participating in various international standards development activities. The Society is committed to a set of internationally recognized standards that best serve the needs of consumers and its membership. To further increase the Society's role in international standards and to continue to serve and provide leadership, the following policy on international standards is instituted:

A. Relationships: ASHRAE will establish and maintain formal relationships with international standards developers[1].
B. Participation: ASHRAE will actively support and participate in international standards development activities. Participation should begin early in the standards development or adoption process and at a level to maximize the Society's ability to add value to the process.
C. Adoption: ASHRAE will pursue the adoption[2] of international standards for use in the U.S. and will promote ASHRAE's standards internationally in accordance with the following principals:
    1. Adopt, as an ASHRAE standard, the best available standard.
    2. Harmonize ASHRAE and international standards.
    3. Promote ASHRAE standards internationally where:
        a. The ASHRAE standard is the industry's standard of first choice with global relevance, or
        b. There is no equivalent international, national or regional standard, or
        c. It is in the best interest of the HVAC&R community.

[1] International standards developers under the ASHRAE International Standards Policy are defined as any industry, national, regional or world agency or organization that create, publish, adopt or promote standards covering HVAC&R equipment and services that would have an impact on the Society's members.

[2] ~~See the definition of adoption in Appendix R of the Standards Committee Manual of Procedures~~

TECHC VOTE: 9-0-0, VCNV

It was moved by Bill Walter and seconded that:

M2 Items 1 through 19 below from the Standards Committee Report be approved for publication:

1. Standards Committee recommends that BSR/ASHRAE Addendum *f (deletes Section 8.12, Machinery Room, Special Requirements)* to ANSI/ASHRAE Standard 15-2016, *Safety Standard for Refrigeration Systems*, be approved for publication.

2. Standards Committee recommends that BSR/ASHRAE Addendum *ak (adds zeotropic refrigerant blend R-459A)* to ANSI/ASHRAE Standard 34-2016*, Designation and Safety Classification of Refrigerants*, be approved for immediate publication.

3. Standards Committee recommends that BSR/ASHRAE Addendum *al (adds zeotropic refrigerant blend R-459B)* to ANSI/ASHRAE Standard 34-2016*, Designation and Safety Classification of Refrigerants*, be approved for immediate publication.

4. Standards Committee recommends that BSR/ASHRAE Addendum *am (adds zeotropic refrigerant blend R-460A)* to ANSI/ASHRAE Standard 34-2016*, Designation and Safety Classification of Refrigerants*, be approved for immediate publication.

5. Standards Committee recommends that BSR/ASHRAE Addendum *an (adds zeotropic refrigerant blend R-460B)* to ANSI/ASHRAE Standard 34-2016*, Designation and Safety Classification of Refrigerants*, be approved for immediate publication.

6. Standards Committee recommends that BSR/ASHRAE Addendum *L (simplifies the infiltration credit calculations)* to ANSI/ASHRAE Standard 62.2-2016, *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*, be approved for publication.

7. Standards Committee recommends that BSR/ASHRAE Addendum *s (provides a mechanism for accounting for the differences between balanced and unbalanced ventilation)* to ANSI/ASHRAE Standard 62.2-2016, *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*, be approved for publication.

8. Standards Committee recommends that BSR/ASHRAE Addendum *b (revises Section 8.10 (Pesticides))* to ANSI/ASHRAE Standard 161-2013*, Air Quality within Commercial Aircraft*, be approved for publication.

9. Standards Committee recommends that BSR/ASHRAE Addendum *c (adds a references to the 2015 ICAO document regarding airline worked education)* to ANSI/ASHRAE Standard 161-2013*, Air Quality within Commercial Aircraft*, be approved for publication.

10. Standards Committee recommends that BSR/ASHRAE Addendum *d (revises requirements in Sections 4, 7 and 8)* to ANSI/ASHRAE Standard 188-2015, *Legionellosis: Risk Management for Building Water Systems*, be approved for publication.

11. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *i (updates the roof heat island mitigation and vegetated roofing sections)* to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

12. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *n (clarifies footnote b to Table 7.5.2A of Standard 189.1-2014)* to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

13. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *p (adds requirements for water-bottle filling stations)* to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

14. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *t (adds requirements for reverse osmosis and on-site reclaim water systems)* to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

15. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *u (adds new requirements for water softeners)* to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

16. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *x (delete Performance Path B)* to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

17. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum y (adds a requirement for an Indoor Environmental Quality (IEQ) occupant satisfaction survey) to ANSI/ASHRAE/USGBC/IES 189.1-2014, Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings, be approved for publication.

18. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *z (revises the lighting power density (LPD) requirements)* to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

19. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *ab (adds SI values for kitchen hood exhausts requirements)* to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

TECHC VOTE: 9-0-0, VCNV

It was moved by Bill Walter and seconded that:

M3 Standards Committee recommended that the TPS for Standard 15 *Safety Standard for Refrigeration Systems,* be revised as shown:

Title: Safety Standard for Refrigeration Systems

Purpose: This standard specifies safe design, construction, installation and operation of refrigeration systems.

Scope:

2.1 This standard establishes safeguards for life, limb, health, and property and prescribes safety requirements.

2.2 This standard applies to:

a. the design, construction, test, installation, operation, and inspection of mechanical and absorption refrigeration systems, including heat pump systems used in stationary applications;
b. modifications including replacement of parts or components if they are not identical in function and capacity; and
c. substitutions of refrigerant having a different designation.

<u>2.3 This standard does not apply to refrigeration systems using ammonia (R-717) as the refrigerant.</u>

BACKGROUND: ASHRAE 15 and IIAR 2 have historically served as additive standards for regulation of ammonia systems, with ASHRAE addressing general design and IIAR addressing ammonia-specific topics. Although functional, the arrangement has burdened ASHRAE 15 with a variety of ammonia-specific exceptions, and it challenges designers, engineers, operators and regulators with the task of deciphering regulations from overlapping standards. These stakeholder groups, which include OSHA and EPA, have questioned the need for two independent standards for ammonia refrigeration systems and have encouraged IIAR to eliminate this unnecessary complexity.

TECHC VOTE: 8-0-1[1], VCNV

It was moved by Bill Walter and seconded that:

M4 The TPS for Standard 188 *Legionellosis: Risk Management for Building Water Systems,* be revised as shown:

Title: Legionellosis: Risk Management for Building Water Systems

1. Purpose

The purpose of this standard is to establish minimum Legionellosis risk management requirements for building water systems.

2. Scope

2.1 This standard provides minimum *legionellosis* risk management requirements for the design, construction, commissioning, operation, maintenance, repair, replacement, and expansion of new and existing buildings and their associated ~~(~~potable and *nonpotable*~~)~~ water systems and components.

2.2 This standard applies to human-occupied commercial, institutional, multiunit residential, and industrial buildings. This standard does not include single-family residential buildings. ~~Only where specifically noted in this standard shall certain *building water systems* or parts of *building water systems* be exempt.~~

2.3 This standard is intended for use by owners and managers of human-occupied buildings, excluding single-family residential buildings~~.~~ and ~~This standard~~ is also intended for those involved in the design, construction, installation, commissioning, operation, maintenance, and service of *centralized building water systems* and components.

BACKGROUND: Scope item 2.1 is editorially revised to remove the unnecessary parenthesis around “potable and non-potable” water. Scope item 2.2 is revised to delete the last sentence that is confusing and unnecessary.

TECHC VOTE: 9-0-0, VCNV

B. TECHNICAL ACTIVITIES *02B*

Information items were reviewed, no motions were presented. Report attached.

C. ENVIRONMENTAL HEALTH *02C*

Information items were reviewed, no motions were presented. Report attached.

[1] Doug Reindl abstained because he is a member of the committee.

D. REFRIGERATION *02D*

Information items were reviewed, no motions were presented. Report attached.

At this point Chair, Pat Graef, joined the meeting.

E. RESIDENTIAL *02E*

It was moved by Dan In-Hout and seconded that:

M5 Technology Council approve $5000 for the Residential Building Committee (RBC) budget starting in FY2017-18 to fund travel for RBC members (or designees) to attend outside conferences to promote ASHRAE residential topics and resources.

Background: Candidates for this travel funding would be selected by the RBC. An example of an appropriate candidate would be participation by an RBC member at the Home Performance Coalition National Meeting. The motion was approved by Residential Building Committee, 11-0-0, CNV

Fiscal Impact: $5000.

TECHC VOTE M4: 8-1[2]-0, CNV

It was moved by Ken Fulk and seconded that the motion be amended as shown:

M5A That Technology Council approve $5000 for the Residential Building Committee (RBC) budget starting in FY2017-18 to fund travel for RBC members (or designees) to attend outside conferences to promote ASHRAE residential topics and resources <u>subject to approval by the President on a case by case basis.</u>

TECHC VOTE: 7-2[3]-0, CNV

Voting council members Doug Reindl and Dan Int-Hout left the meeting changing the vote count to eight.

F. RESEARCH *02F*

It was moved by Art Geisler and second by Byron Jones that:

M6 Technology Council request that 6% in lieu of 4% be transferred from the Research Reserve fund for the next two years (17-18, 18-19).

Background: Current Research Reserve Fund balance is $5.5 million. This change would add $110,000.00 to the Research Budget for spending in the next two years. The Research budget is tight for the next two years to meet expected expenditures.

TECHC VOTE: 8-0-0, CNV

[2] Doug Reindl voted no.
[3] Ken Fulk and Doug Reindl voted no.

M7 It was moved and seconded, that

Technology Council recommend to the BOD that Section 2.421.004 Operation of the Rules of the Board (ROB) be modified as indicated below.

2.421.004 OPERATION

2.421.004.1 General Requirements

A. ASHRAE through its Research Administration Committee shall
   1. Support and maintain a vigorous research program;
   2. Sponsor research at universities and other established laboratories, including research and studies by consulting engineers and other qualified organizations;
   3. Use budgeted funds for project costs, administration of the research program and the publication of research.
   4. Terminate any active research project if it is determined by the project's sponsoring committee and RAC that it is in the best interest of ASHRAE.

Fiscal Impact: None.

Background: The addition of Item #4 to this section of the ROB will allow RAC to quickly and efficiently terminate projects that have a low probability of success thereby conserving ASHRAE research funds for use on other projects (RAC Chair noted that this proposed change should also be sent to SRC in parallel for them to review). **RAC Vote: 13-0-0, CNV**

TECHC VOTE: 4-5-0, CNV - Motion 7 Failed

3. SUBCOMMITTEE REPORTS

A. OPERATIONS

Information items were reviewed, the motions listed below were presented. Report attached.

It was moved by John Harrod that:

M8 The production and distribution of the Technology Council Members First Newsletter be terminated.

Background: Operations subcommittee felt that the information in the Tech Council Members First Newsletter was repetitive and unnecessary.

TECHC VOTE: 8-0-0, CNV

B. SPECIAL PROJECTS *03B*

Information items were reviewed, the motions listed below were presented. Report attached.

It was moved by Jaap Hogeling that:

M9 Technology Council commit a maximum of $45K (23% of the $195,000 estimated budget) for the development of Residential Design Guide for FY 2017-18.

Background: Special Projects approved the initiation of a new Regular Special Project for a Residential Design Guide to be developed in 2017-8. This document is one of President-elect Bjarne Olsen's PEAC initiatives, and there is currently $30K allocated for this document in the PEAC initiative budget.

Special Projects recommends that outside funding be solicited, but ASHRAE funds also be allocated. Because this document will require expertise from organizations active in the residential construction market in order to succeed, requiring outside funding will help ensure buy-in for the project from those organizations. However, it is important that ASHRAE signify their support for the project by committing some financial support, so ASHRAE funds will also be required. The current estimated budget for the project is $195K.

The project was approved contingent upon 77% outside co-funding. The motion to establish the project passed in the Subcommittee 4-0-0 CNV

Financial Impact: $45K

It was moved by John Harrod and seconded by Doug Reindl that:

M9A Motion 9 above be postponed to the next TechC Meeting.

TECHC VOTE: 8-0-0, CNV

Secretary's note: RAC subsequently decided to submit an RTAR for this project rather than pursue a Special Project. This would suggest that Motion 9 above should be withdrawn altogether rather than reconsidered as a postponed motion at a later date.

It was moved by Jaap Hogeling that:

M10 Tech Council commit a maximum of $125K (100% of the $125,000 estimated budget) for the development of a Standard 100 User's Manual.

Background: Special Projects Subcommittee is recommending that Tech Council approve the full estimated budget, but that additional outside funding be solicited. The motion to initiate this special project was approved by Special Projects Subcommittee 4-0-1, CV

Standard 100-2015 believes that a User's Manual is needed to support adoption of Standard 100 by interested Authorities Having Jurisdiction. BC Hydro, a crown electric utility in British Columbia, Canada has expressed interest in the development of a building energy retrofit code and have identified Standard 100-2015 to be a potential standard to be referenced. BC Hydro has also been identified as a possible source of outside funding of this User's Manual ($20K in possible funding).

Financial Impact: $125K total estimated cost. The timeline for the project targets a start date in spring 2017 which would mean roughly 30% of the cost would fall into FY 2016-17 with the remainder of the cost falling in FY 2017-18.

TECHC VOTE: 8-0-0, CNV

C. DOCUMENT REVIEW *03C*

Information items were reviewed, the motions listed below were presented. Report attached.

It was moved by Ginger Scoggins that:

M11 Technology Council reaffirm the *Refrigerants and their Responsible Use* PD.

BACKGROUND: The current PD (**DRSC-A**) expires July 2, 2017. A separate motion requested a revision of the PD. This reaffirmation would prevent expiration of the PD until the work of the revision committee can be completed. The intent is for the revised PD to replace this reaffirmed version as soon as possible.

TECHC VOTE: 8-0-0, CNV

It was moved by Ginger Scoggins that:

M12 Technology Council reaffirm the *Airborne Infectious Diseases* PD.

BACKGROUND: The current PD (**DRSC-B**) expired January 19, 2017. This PD does cconform to the current ASHRAE PD template. EHC passed another motion to revise the PD. The goal is to develop more comprehensive updates but this reaffirmation will keep the PD available until that revision can be completed.

TECHC VOTE: 8-0-0, CNV

It was moved by Ginger Scoggins that:

M13 Technology Council recommend that the Board of Directors (BOD) ExCom initiate a revision of the *Refrigerants and their Responsible Use* position document (PD).

BACKGROUND: The intent for the revision would be to update the PD (**DRSC-A)** to reflect advancements since the initial publication, specifically changes from the Kigali Amendment to the Montreal Protocol. UNEP has expressed that updated guidance from ASHRAE is sought as soon as possible. The title, purpose and scope (TPS) (**DRSC-C**) would not change**.**

TECHC VOTE: 8-0-0, CNV

It was moved by Ginger Scoggins that:

M14 Technology Council recommend that the BOD ExCom initiate a revision of the *Airborne Infectious Diseases* PD.

BACKGROUND: The current PD (**DRSC-B**) expired January 19, 2017. The TPS (**DRSC-D**) is only slightly changed**.** Environmental Health Committee (EHC) passed another motion to reaffirm current PD until a revision can be completed.

TECHC VOTE: 8-0-0, CNV

It was moved by Ginger Scoggins that:

M15 Technology Council recommend that the BOD ExCom initiate a revision of the *Climate Change* PD.

BACKGROUND: The current PD expired February 26, 2017. Members of TC 2.5, Climate Change, led by Don Brundage worked on a reaffirmation draft (**DRSC-E**). The main task was to reference an updated IPCC AR5 report. DRSC reviewed changes and deemed them to be beyond the editorial revisions appropriate for a reaffirmation.

TECHC VOTE: 8-0-0, CNV

It was moved by Ginger Scoggins that:

M16 Technology Council recommend that the BOD approve the revised *Ammonia as a Refrigerant* Position Document (PD).

BACKGROUND: The revised PD is shown in **DRSC-F** with approved TPS **(DRSC-G).** The current *Ammonia as a Refrigerant* PD is set to expire July 2, 2017. The stated purpose of the revision was to assure compliance with the latest PD template, to assure consistency with *Refrigerants and their Responsible Use* PD, to include recent technical advancements, and to update references. The PD committee approved the revision unanimously (7-0-0 CV). REF is the cognizant technical committee, participated in the review, offered comments to the PD committee and recommended approval (11-0-1 CNV).

TECHC VOTE: 8-0-0, CNV

4. DIRECTOR OF TECHNOLOGY *04*

DOT, Claire Ramspeck, updated the council on the current activities of the Technology Department. The Director's report is attached.

5. EXECUTIVE SESSION

It was moved and seconded that:

M17 Tentative research project 1721-TRP, *Oil Return and Retention in Unitary Split System Gas Lines with HFC and HFO Refrigerants*, be awarded to the Purdue University for a period of 24 months at a total cost to ASHRAE of $120,714.

MOTION PASSED

It was moved and seconded that:

M18 Tentative research project 1734-TRP, *Reproducing a Representative Urban Atmospheric Aerosol Distribution at High Concentration in the Laboratory for Air Filter Ageing to be used in ASHRAE GPC 35P for Determining the Energy Consumption Caused by Air Filters*, be awarded to the Purdue University for a period of 24 months at a total cost to ASHRAE of $140,000.

MOTION PASSED

It was moved and seconded that:

M19 Tentative research project 1785-TRP, *Experimental Validation of Refrigerant Charge Models in Coils for Residential Split Systems*, be awarded to Oklahoma State University for a period of 30 months at a total cost to ASHRAE of $139,615.

MOTION PASSED

There being no further business to come before the Council, the meeting adjourned at 11:45 am

Attachments to these minutes can be found on the Technology Council Basecamp website.