



REFRIGERATION COMMITTEE (REF) MINUTES

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**PRINCIPAL MOTIONS
JANUARY 25th, 2009**

No.	Page No.	Motion
1	1	The minutes of the June 22, 2008 meeting in Salt Lake City be approved.
2	2	REF recommends that ASHRAE offer an opinion on EPA ban of R-22 in new systems beyond 2010
3	3	REF recommends to Tech Council that there is technical information available in ASHRAE to adequately assist in alterative refrigerant system design and installation for the transition from R22.
4	4	REF recommends that the Briley Award procedures in the Reference Manual be changed as shown.
5	4	REF approves Doug Reindl & Todd Jekel as winners of the inaugural George Briley award for their Journal article titled "Heat Recovery in Industrial Systems."
6	6	REF recommends that a seminar program for Louisville titled 'CO ₂ Developments in Refrigeration' be approved and submitted as first priority.
7	6	REF recommends that a forum program for Louisville related to 'activities and ideas for refrigeration courses and technical program involvement' be approved.
8	8	REF request Fields to go to Members Council to recommend CTTC encourage refrigeration activities and programs at chapter level.

**ACTION ITEMS FROM WINTER MEETING
CHICAGO JANUARY 25th 2009**

No.	Page No.	RESPONSIBILITY	SUMMARY
1	1	Anderson	Send letter following up with Gordon Holness and PAOE subcommittee chair on refrigeration activity requirements for PAOE eligibility.
2	3	Anderson	Lead effort to survey the need for a commissioning guideline on refrigeration systems. Develop TPS as appropriate.
3	4	Scott/Gage	Develop 1- page summary for building owners and chapters to promote ASHRAE, the benefits of submitting for a REF award, the importance of refrigeration, etc.
4	4	Anderson	Appoint award judging panel the REF Awards prior to the Annual meeting.
5	4	Staff	Update Reference Manual to show changes to Briley Award procedures.
6	5	Siller/Anderson	Update George Briley on the establishment and inaugural award of the George Briley Journal award.
7	5	Staff	Procure plaque and notification letters for winners of George Briley Award
8	5	REF	Forward speaker nominations for the Distinguished Lecturer Program to Ron Vallort.
9	5	TC Liaisons	Request and recruit TC member participation for the refrigeration speakers list.
10	6	Fricke/Anderson	Explore option for Tech Council to fund and proceed with refrigeration webinar with REF as lead.
11	6	TC Liaisons	Return TC Liaison checklist forms to Sluga.
12	6	Staff	Establish a password protected FTP site for posting and access to CO ₂ chapter materials.
13	7	REF	Provide input on the 2010-2015 strategic research plan to Ayub.

**ACTION ITEMS FROM ANNUAL MEETING
SALT LAKE JUNE 22th 2008**

No.	Page No.	RESPONSIBILITY	SUMMARY	STATUS
1	3	Staff	Forward procedures for ASHRAE Best Paper Award to Hael for review.	Complete
2	3	Siller	Contact incoming SAC chair to discuss refrigeration related topic for next student design competition	Complete
3	3	Siller	Contact ALI to volunteer to assist review of refrigeration SDL	Complete
4	4	REF TC liaisons	Return TC Liaison checklist forms to Sluga	Complete
5	4	Ayub	Sent letter to Badger requesting copyright agreement with IIAR for CO ₂ chapter.	Complete
6	4	Topliss	Submit latest draft for distribution for review.	Complete
7	4	Staff/Topliss	Distribute to relevant TC's and interested individuals for assistance in review.	Complete
8	4	Sluga	Distribute 2010 introductory chapter outline to REF.	Ongoing
9	5	Kazachki	Submit CO ₂ seminar program(s) for Chicago prior to deadline	Complete
10	5	Gage, Hael	Submit forum program for Chicago prior to deadline	Complete

**ACTION ITEMS FROM WINTER MEETING
NEW YORK JANUARY 20th 2008**

No.	Page No.	RESPONSIBILITY	SUMMARY	STATUS
4	4	Hael, Shepherd, Bevington	Design Briley Award for approval in Salt Lake. Suggest any minor editorial changes to procedure/form as appropriate.	Complete
5	4	Staff	Compile list of ASHRAE Journal Articles from 07-08 to REF for Annual Meeting.	Complete

LIST OF APPENDICES

- Appendix 1: REF Agenda for Chicago
- Appendix 2: 2008-2009 MBO's status report
- Appendix 3: Natural Refrigerants PD
- Appendix 4: Briley Award Procedures Change
- Appendix 5: Distinguished Lecturer Program Nomination Form
- Appendix 6: Refrigeration Speakers List
- Appendix 7: Liaison Report
- Appendix 8: Special Project plan

LIST OF ACRONYMS

AEDG	-	Advanced Energy Design Guide
ALI	-	ASHRAE Learning Institute
AMORTS	-	Assistant Manager of Research and Technical Services
ASHRAE	-	American Society of Heating, Refrigerating, and Air-conditioning Engineers
BOD	-	Board of Directors
CNV	-	Chair Not Voting
CV	-	Chair Voting
CO ₂	-	Carbon Dioxide
CRC	-	Chapter's Regional Conference
CTTC	-	Chapter Technology Transfer Committee
DSL	-	Distinguished Speaker List
EPA	-	Environmental Protection Agency
GCCA	-	Global Cold Chain Alliance
IARW	-	International Association of Refrigerated Warehouses
IAR	-	International Institute of Ammonia Refrigeration
MBO	-	Management by Objective
MOU	-	Memorandum of Understanding
NEBB	-	National Environmental Balancing Bureau
ODS	-	Ozone Depleting Substances
PAOE	-	Presidential Award of Excellence
PD	-	Position Document
PDC	-	Professional Development Course
RAP	-	Research Advisory Panel
REF	-	Refrigeration Committee
RSES	-	Refrigeration Services and Engineering Society
RVC	-	Regional Vice Chair
SAC	-	Student Activities Committee
SDL	-	Self Directed Learning
TC	-	Technical Committee
TPS	-	Title, Purpose, Scope

**MINUTES
REFRIGERATION (REF) COMMITTEE
JANUARY 25, 2009
CHICAGO, IL**

MEMBERS PRESENT:

Don Siller, Chair
Kent Anderson, Vice Chair
Brian Fricke
Cynthia Gage
Donald Hay
Georgi Kazachki
Norbert Mueller
Bruce Nelson
Doug Scott
John Sluga
Ron Vallort
Art Garbarino, Consultant
Andy Persily, Coordinating Officer
Costas Balaras, BOD Ex-Officio

GUESTS:

Zahid Ayub
Bruce Badger
Wayne Borrowman
Marc Chasserot
Jon Edmonds
Jim Fields
Bruce Griffith
Bill Harrison
Patrick Hughes
Doug Reindl
Chris Seeton

STAFF:

Steve Hammerling, AMORTS

MEMBERS ABSENT:

Jim Shepherd

1.0 CALL TO ORDER AND ROLL CALL

Chair Don Siller called the meeting to order at just after 8:00 a.m. Members and guests introduced themselves.

2.0 APPROVAL OF MINUTES

It was moved and seconded that,

1. The minutes of the June 22nd, 2008 meeting in Salt Lake City be approved.

MOTION 1 PASSED: 11-0-0 CV

3.0 REVIEW OF AGENDA

The agenda distributed prior to the meeting was reviewed. An item 5.4.1 was added for Vallort to discuss the Global Cold Chain Alliance (GCCA) activities. The agenda is included with these minutes as **Appendix 1**.

4.0 CHAIRMAN'S REPORT

4.1 Disposition of REF Motions from Last Meeting

Anderson reported having attended Technology Council their Tech Weekend meeting in Atlanta. REF had passed a motion to recommend President-Elect (Holness) include minimum requirements for refrigeration-related activities to be eligible for next year's Presidential Award of Excellence (PAOE). Technology Council approved this motion and Persily forwarded input to the President-Elect. Anderson spoke with Holness at this meeting to emphasize the need for this to the PAOE subcommittee but stated a follow up may be helpful.

Action Item 1 – Anderson – Send letter following up with Gordon Holness and PAOE subcommittee chair on refrigeration activity requirements for PAOE eligibility.

Also at Technology Weekend, REF recommended Technology Council approve an ASHRAE Special Project for a refrigeration energy design guide. The Council requested that REF submit a formal special project proposal to their Special Project subcommittee. An MBO and associated action items to accomplish this task will be discussed later on the agenda.

REF recommended approval of the draft of the Natural Refrigerants Position Document (PD) in Salt Lake City. This PD will also be discussed later on the agenda.

4.2 New Action Items for REF

Technology Council requested an approach, possibly a special project, to developing a Green Guide/Design Guide. REF has drafted an approach for design guides on energy efficient refrigerated facilities and refrigeration systems and plans to submit a proposal to Special Projects subcommittee for consideration at their Annual Meeting in Louisville. Included will be benchmarking, energy efficiency and otherwise sustainable refrigerated facilities and refrigeration systems. This plan will also be addressed later on the agenda.

Siller submitted material for Technology Council's Members First newsletter. This newsletter is distributed to chapter presidents and available [here](#). The newsletter focused on the CO₂ chapter and REF's position document activities.

4.3 Management by Objectives (MBOs)

Status of various MBO's to be covered on agenda as appropriate. A status MBO report (**Appendix 2**) will be reported to Technology Council. Siller requested additional progress updates on all MBOs by mid-April at a potential status conference call.

4.4 Other

Vallort summarized efforts related to the GCCA noting that a memorandum of understanding (MOU) was signed with ASHRAE in August 2008. Persily visited the GCCA on ASHRAE's behalf to sign the MOU.

Vallort authored a letter to leadership highlighting activities to focus on refrigerated warehouses. These included various research efforts, publications, and design guides. Bill Hudson leads the GCCA and expressed a willingness to help. The next step is to approach Hudson with specific tasks. The GCCA can assist in identifying and including experts for chapter updates, to make benchmark data available, and other tasks. This will be a tremendous opportunity to help and expand the work of ASHRAE Technical Committees (TC). REF can work through TC liaisons to notify TC's and help them to engage GCCA.

REF discussed concerns related to the Environmental Protection Agency's (EPA) proposed ban on the manufacture of R-22 containing equipment. A motion was made recommending that ASHRAE provide a formal opinion or position on the subject failed in REF.

It was moved and seconded that,

2. REF recommends that ASHRAE offer an opinion on EPA ban of R-22 in new systems beyond 2010.

MOTION 2 FAILED: 5-6-0, CNV

However, REF believes that there currently exists the technology and design related information in ASHRAE to allow air conditioning and refrigeration systems to be designed and installed without the use of R-22. It was stated that the EPA had released clarification that the ban was related to the date of manufacturer, not installation. This may quell some of the controversy. REF or ASHRAE may wish to publish some sort of background or summary piece on the subject, perhaps a program or summary of existing guidance.

It was moved and seconded that,

3. REF recommends to Tech Council that there is technical information available in ASHRAE to adequately assist in alternative refrigerant system design and installation for the transition from R22.

BACKGROUND: REF to report to Tech Council as an information item to consider publication of resources on using refrigerants.

MOTION 3 PASSED: 11-0-0 CNV

5.0 VICE CHAIRMAN'S REPORT

5.1 Fiscal report

Anderson noted there was little information to report on the REF budget. REF has the smallest committee budget under Technology Council. There is a challenge to REF to develop programs with fiscal impacts so REF has an opportunity to identify and initiate these sorts of programs.

5.2 ASHRAE Refrigeration Commissioning Guideline

Persily noted there have been discussions with Mike Dolim of the National Environmental Balancing Bureau (NEBB) on an ASHRAE commissioning guideline for refrigeration systems. NEBB typically develops procedural manuals, not standards or guidelines but NEBB invited ASHRAE to do a guideline for NEBB to use to develop a manual. NEBB may develop something with or without an ASHRAE guideline but would prefer an ASHRAE Guideline with participation from NEBB and possibly the RSES. Anderson asked Dolim for a formal request explaining what NEBB expected from ASHRAE.

Fields asked REF if there is an interest in having a refrigeration commissioning guideline. REF would need to develop title, purpose and scope (TPS) and submit to standards committee. A survey of the existing information, current TPS's, etc. would be necessary. There was discussion on how a refrigeration commissioning guideline could fit into the existing 1.X Guideline structure, if one guideline was appropriate, or if multiple guidelines would be ideal. Other TC's have discussed commissioning for specific refrigeration system types. REF will consider the need for ASHRAE guidelines on refrigeration system commissioning. REF will survey the need and consider submission of a title, purpose and scope to Standards Committee as appropriate.

Action Item 2 – Anderson – Lead effort to survey the need for a commissioning guideline on refrigeration systems. Develop TPS as appropriate.

6.0 POSITION DOCUMENTS (PD)

6.1 Natural Refrigerants

This PD (**Appendix 3**) was approved by REF and Technology Council at the Annual Meeting in Salt Lake. The BOD will consider approval at this meeting. Gage volunteered to help prepare announcements for Insights as necessary.

6.2 Ozone Depleting Substances (ODS)

The PD developed by Goldschmidt and his PD committee has been approved and posted on the ASHRAE website (www.ashrae.org/aboutus/page/335). Another revision is being developed with a draft anticipated for the June meeting.

7.0 REFRIGERATION AWARDS

Gage summarized efforts to publicize the George Briley, Comfort Cooling and Milt Garland Awards. A write-up was submitted for March Insights to coincide with start of Chapter Regional Conference (CRC) schedules. Gage will prepare an announcement of winners and call for more articles to submit in May for the June Insights. It was noted that some sort of notice should be developed to publicize the awards to building owners that may not be as familiar with ASHRAE.

Action Item 3 – Scott/Gage – Develop one- page summary for building owners and chapters to promote ASHRAE, the benefits of submitting for a REF award, the importance of refrigeration, etc.

7.1 Milt Garland & Comfort Cooling Awards

REF received a single submission for both the Milton Garland and Comfort Cooling Awards.

REF approved Russell Heiken, PE, as the winner of the ASHRAE Comfort Cooling Award for the project titled Carlisle Regional Medical Center. The Comfort Cooling Award will be presented at the Annual Meeting in Louisville.

REF approved Cesar Luis, PE, as the winner of the Milton Garland Award for the project titled San Fernando Brewery Refrigeration Modernization Project. The Milton Garland Award will be presented at the Annual Meeting in Louisville.

Action Item 4 – Anderson - Appoint award judging panel the REF Awards prior to the Annual meeting.

7.2 ASHRAE Journal Article Award

Hammerling distributed proposed changes (**Appendix 4**) to the Briley Award nomination and selection process in the REF Reference Manual.

It was moved and seconded that,

4. REF recommends that the Briley Award procedures in the Reference Manual be changed as shown.

BACKGROUND: The changes modify the scoring form and judging panel requirements, and also eliminate the nomination process for staff to distribute all eligible articles to the subcommittee for review and judging.

MOTION 4 PASSED: 11-0-0, CNV

Action Item 5 - Staff – Update Reference Manual to show changes to Briley Award procedures.

Siller discussed the scoring and the Journal articles reviewed prior to the meeting. There were seven articles considered with an article titled *Heat Recovery in Industrial Refrigeration* by Doug Reindl and Todd Jekel scoring highest.

It was moved and seconded that,

5. REF approves Doug Reindl & Todd Jekel as winners of the inaugural George Briley award for their Journal article titled “Heat Recovery in Industrial Systems.”

MOTION 5 PASSED: 11-0-0, CNV

BACKGROUND: The award will be presented during the REF meeting at the Annual Meeting in Louisville.

Action Item 6 – Staff – Procure plaque and notification letters for winners of George Briley Award.

Action Item 7 – Siller/Anderson – Update George Briley on the establishment and inaugural award of the George Briley Journal award.

8.0 BOD EX-OFFICIO/COORDINATING OFFICER

BOD Ex-Officio Costas Balaras addressed REF thanking the committee for their work and efforts. He noted that ASHRAE Society is asking Councils and Committees to review the budget to cut spending. The BOD will continue to use program based budgeting looking for measureable benchmarks. Councils have been asked to explore opportunities for income generating programs within the Councils and their Committees.

President Harrison visited REF and asked to address committee. Harrison commented on his travel throughout the year as ASHRAE President and the focus on the importance of refrigeration in the world. Studies estimate that from one-third to one-half of the food in the global food chain of developing countries is affected by spoilage. In areas with highly developed food chains, the high energy use requirements are an issue. ASHRAE has a tremendous opportunity to address these issues for both the developed and developing world. Harrison asked what ASHRAE leadership can do to help facilitate REF programs to address these issues. REF thanked Harrison for his comments noting support for approval and fiscal support for green guides, AEDG's, research, etc. would help to address needs. Assistance to engage and empower both chapters and student members is also key. Harrison invited everyone on REF to contact him with input.

9.0 SUBCOMMITTEE REPORTS

9.1 Functional

There are no changes to the REF Manual of Procedures (MOP) or Rules of the Board (ROB), only the Reference Manual change discussed previously on the Briley Award procedure.

9.2 Education

Vallort reported there are a few refrigeration experts already in the Distinguished Lecturer Program and many are international speakers. Vallort asked REF members to nominate (**Appendix 5**) more refrigeration speakers.

Action Item 8 – REF - Forward speaker nominations for the Distinguished Lecturer Program to Ron Vallort.

Gage reported on progress in the generation of a refrigeration speakers list (**Appendix 6**). Invitations were sent to past refrigeration speakers requesting their participation and details on their expertise, locations, etc. To date, 17 replied 'yes', 6 declined to participate, and 21 have not replied. The eventual goal is to get a list with representation in all regions and a broad range of topics for posting on the website and Insights. Gage will include non-members on the list to help accomplish this goal.

Action Item 9 – REF TC Liaisons – Request and recruit TC member participation for the refrigeration speakers list.

Nelson provided current status of student design competition. He noted that Student Activities Committee (SAC) has planned theme for next competition. Participation on the SAC or with the incoming SAC chair may be the best way to go about getting an influence in the competition.

REF submitted the outline for the refrigeration seminar to the Professional Development Committee (PDC). PDC said there may be a conflict with a refrigeration Self Directed Learning (SDL) course. They are converting a SDL to an online format that went out in Fall 08. The SDL is must more robust

than the 2 hour refrigeration seminar REF developed. Brian Fricke is very much involved in the SDL development and will compare the outline to the SDL e-course to measure overlap. The course is not ready for REF review at this point but REF can assist then when it is at that point.

Action Item 10 – Fricke/Anderson – Explore option for Tech Council to fund and proceed with refrigeration webinar with REF as lead.

9.3 Liaisons

Sluga distributed a summary of TC liaison checklists which is included with these minutes as **Appendix 7**.

Action Item 11 –TC liaisons – return TC Liaison checklist forms to Sluga

Anderson plans to discuss formal liaisons with other refrigeration organizations at the Annual meeting. REF may wish to include them on the REF roster as corresponding members. IIAR, RSES, IARW, NEBB, etc. were identified. The list of presidential liaisons may serve as a starting point to identify organizations. A discussion of organizations and appropriate tasks we want to include in such a role can be discussed in Louisville.

9.4 Publications

REF appointed a steering committee (**Topliss**, Chasserot, Kazachki, Jekel, Gage, Scott, Hinde, Siller) to coordinate the development of the CO₂ chapter for the 2010 Refrigeration volume of the ASHRAE Handbook. TC 10.3 is responsible for the chapter and members from other Section 10 TC's including 10.1, 10.7 and 10.10 have been asked to expedite the development review the chapter. Topliss is coordinating this effort and has generated a lot of material for a draft. Topliss had communicated with Bruce Badger to discuss a copyright agreement with IIAR for CO₂ chapter materials. This issue has been resolved between IIAR and ASHRAE Publications department.

Action Item 12 – Staff – Establish a password protected FTP site for posting and access to CO₂ chapter materials.

Scott detailed an approach (**Appendix 8**) for REF to develop design guides on energy efficient refrigerated facilities and refrigeration systems through the ASHRAE Special Projects subcommittee. REF will submit a proposal to for consideration by Special Projects at their Annual Meeting in Louisville. Included will be benchmarking, energy efficiency and otherwise sustainable refrigerated facilities and refrigeration systems.

9.5 Program

Kazachki noted that the proposed seminar program for Chicago titled 'CO₂ Developments in Refrigeration' was not approved. He will propose a seminar for Louisville before the February 6th deadline but Europeans are not likely to participate at a summer meeting with no trade show.

It was moved and seconded that,

6. REF recommends that a seminar program for Louisville titled 'CO₂ Developments in Refrigeration' be approved and submitted as first priority.

MOTION 6 PASSED: 9-0-0, CNV

It was moved and seconded that,

7. REF recommends that a forum program for Louisville related to 'activities and ideas for refrigeration courses and technical program involvement' be approved.

MOTION 7 PASSED: 9-0-0, CNV

BACKGROUND: This forum was submitted for Chicago but not approved.

REF sponsored the following green refrigeration programs for Chicago:

- Seminar 46, CO₂ Systems, Components and Applications

Several other refrigeration related programs in Chicago were sponsored by Section 10 TC's and are listed below. Additional refrigeration-related presentations were sponsored by other sections and committees included:

- Seminar 3, Measuring Oil Concentration in Circulation
- Seminar 12, Advances in Supermarket Display Case Technology: Analytical Tools and Test Results
- Forum 10, Refrigerant Pipe Insulation: Are Thickness Guidelines in Refrigeration Handbook Chapter 33 Still Relevant in Light of Today's Energy Costs?
- Transactions Session 5, The History of Cold

9.6 Research

Ayub addressed REF on ASHRAE research. Ayub noted he was appointed to the Research Advisory Panel (RAP) tasked to update the ASHRAE strategic research plan for 2010-2015. There are eleven members on the committee, with Ayub as the representative from a refrigeration background. To date, RAP has identified a list of primary research goals, one of which is 'natural refrigerants and system charge reductions'. Ayub asked the committee for input to communicate to RAP. Input might include topics to include in the strategic plan.

Action Item 13 – REF – Provide input on the 2010-2015 strategic research plan to Ayub

9.7 International

Hay was asked to follow Ayub as the international liaison for REF. Anderson noted the expectation for the liaison was to communicate and share information back and forth with international refrigeration organizations and on refrigeration activities within and outside of ASHRAE. A report at REF meetings summarizing major happenings and activities would be of interest.

Hay noted he'd spoken with representatives from a group in Mexico interested in hydrocarbons. They noted they'd contacted ASHRAE with an inquiry on the use of hydrocarbons in Standard 15 and within ASHRAE but have not heard back with any guidance.

10.0 CHAPTER TECHNOLOGY TRANSFER COMMITTEE (CTTC) LIAISON

Garbarino raised an idea for new refrigeration Regional Vice-Chairs (RVC's) to coordinate refrigeration activities each region that would report on chapters visited and programs on refrigeration. Also, Garbarino proposed awarding the Milton Garland Award to the regional refrigeration RVC with most refrigeration related activities. The goal being to promote refrigeration activity at the grass roots level.

Siller noted the intent of the Milt Garland Award was for excellence in project design and was not sure this particular award would be appropriate for this. Fields noted he was not against award for good member activity but that such a change would take the mechanism to nominate winners away from REF because REF is not be involved in grass roots level nominations. Additionally, adding RVC's to regions would be similar to adding a new committee.

Anderson applauded Garbarino's goal and noted the motion was in fact discussed at Technology Weekend with Technology Council. Anderson suggested postponing a REF motion until later to give the opportunity for more discussion during a conference call or future meeting. REF would attempt to enhance chapter level activities via better outreach, enhanced PAOE criteria, etc.

It was moved and seconded that,

8. REF request Fields to go to Members Council to recommend CTTC encourage refrigeration activities and programs at chapter level.

MOTION 8 PASSED: 10-0-0, CNV

11.0 NEXT MEETING

The next meeting of REF is scheduled for Sunday, June 21st, 2009 in Louisville, KY. Various conference calls may be scheduled as needed, particularly for the CO₂ chapter and special project opportunities. Staff will schedule a conference call to discuss special project plan/proposal.

12.0 ADJOURNMENT

The REF meeting was formally adjourned shortly after 12:00 p.m.

Refrigeration Committee Meeting Agenda

Sunday, January 25th, 2009

8:00 AM – 12:00 PM

Palmer House Hilton - Wilson (3)

- 1.0 CALL TO ORDER
- 2.0 ROLL CALL & INTRODUCTIONS
- 3.0 APPROVAL OF MINUTES- Annual Meeting – Salt Lake City, UT, June 22nd, 2008
- 4.0 REVIEW OF AGENDA
- 5.0 CHAIRMAN'S REPORT – *Siller*
 - 5.1 Disposition of Motions from Last Meeting
 - 5.1.1 REF recommends that Technology Council recommend to the President-Elect that they include minimum requirements for refrigeration-related activities to be eligible for next year's PAOE program.
 - 5.1.2 REF recommends that Technology Council approve an ASHRAE Special Project for a refrigeration energy design guide.
 - 5.1.3 REF recommends that Operations Subcommittee recommend approval of the draft of the Natural Refrigerants PD.
 - 5.2 New Action Items for REF
 - 5.2.1 Tech Weekend - Submit approach to developing a Green Guide/Design Guide for refrigeration to the Special Projects subcommittee
 - 5.2.2 Tech Weekend - Submit reports for Members First newsletter to Tom Watson by October 27, 2008
 - 5.3 Status 2008-09 MBO's
 - 5.4 Other
 - 5.4.1 GCCA - *Vallort*
- 6.0 VICE-CHAIRMAN'S REPORT – *Anderson*
 - 6.1 Fiscal report
 - 6.2 ASHRAE Refrigeration Commissioning Guideline
 - 6.3 Other
- 7.0 POSITION DOCUMENT
 - 7.1 Natural Refrigerants
 - 7.2 Ozone Depleting Substances
- 8.0 REFRIGERATION AWARDS (MBO's 1b, 2e) - *Shepherd*
 - 8.1 Milt Garland Award
 - 8.2 Comfort Cooling Award
 - 8.3 ASHRAE Journal Award
 - 8.3.1 Procedures
- 9.0 BOD EX-OFFICIO – *Balaras*
- 10.0 COORDINATING OFFICER – *Persily*
- 11.0 SUBCOMMITTEE REPORTS
 - 11.1 Functional
 - 11.1.1 MOP & ROB
 - 11.2 Education (MBO's 1c, 1d, 1g, 2b, 2c)
 - 11.2.1 Webinar/Professional development course
 - 11.2.2 Student design competition
 - 11.3 Liaisons (MBO's 1f) – *Sluga*
 - 11.4 Publications (1h)
 - 11.4.1 CO₂ chapter status - *Topliss*
 - 11.4.2 Intro Refrigeration chapter for 2010 Handbook – *Sluga*
 - 11.4.3 Special Project – Green/Design Guide- *Anderson*
 - 11.5 Program (1i, 1l, 2d)
 - 11.5.1 Seminar program for Chicago titled 'CO₂ Developments in Refrigeration'
 - 11.5.2 Forum program for Chicago related to 'activities and ideas for refrigeration courses and technical program involvement.'
 - 11.6 Research (MBO's 1e, 3a-3d)
 - 11.7 International
- 12.0 CTTC LIAISON – *Garbarino*
- 13.0 UNFINISHED BUSINESS
- 14.0 NEW BUSINESS
- 15.0 NEXT MEETING – Louisville, KY, June 21st, 2009
- 16.0 RECAP
- 17.0 ADJOURNMENT

No	Objective/Goals	Completion Date	Fiscal Impact	Responsible Person(s)	Status
1.	Increase REF Committee Activity Level and Visibility				--
	a. Assign each REF member to at least (1) goal, and encourage quarterly progress reports and participation in quarterly conference calls.	06/08	None	All REF	Ongoing
	b. Publicize the George Briley ASHRAE Journal Award and encourage refrigeration related articles published in the Journal, through Insight announcements.	Quarterly	\$200	Gage, Bevington	Gage will prepare an announcement of Briley winner and call for more articles to submit in May for the June Insights.
	c. Publicize, develop and deliver Webinar to increase awareness and interest in refrigeration.	06/09	UK	Fricke, Reindl, Halel	Action item to explore option for Tech Council to fund and proceed with refrigeration webinar with REF as lead.
	d. Assist in reviewing the Self-Directed Learning Course (SDL) on Refrigeration.	UK	UK	Vallort, Nelson	Fricke to compare the outline to the SDL e-course to measure overlap.
	e. Work with RAC to improve communications with Section 10 TC's and streamline process of generating and approving RTAR's and WS's.	01/09	None	Siller, Anderson	Ongoing through TC liaison checklist.
	f. Work with TAC to improve communications between REF and refrigeration related TC's, and Projects (SDL).	06/09	None	Siller, Anderson	Ongoing through TC liaison checklist.
	g. Develop the Scope for a refrigeration related topic for the 2009 Student Design Competition, and forward it to Student Activity Committee.	06/09	UK	Nelson, Ayub, Reindl,	SAC has planned theme for next competition. Participation on the SAC or with chair may be the best way to go about getting an influence in the competition.
	h. Coordinate development of a chapter on CO ₂ to be published in 2010 Handbook, and communicate information to All Section 10 TC's, and TC 3.2, 3.3, 3.4, 3.5.	06/09	None	Topliss, Siller, Anderson, Halel	Ongoing. Conference scheduled for after meeting
	i. Promote 'Green Refrigeration' through programs at the Winter Meeting in Chicago and the Annual Meeting in Louisville.	01/09, 06/09	UK	Kazachki, Gage	REF sponsored Seminar 46 - CO ₂ Systems, Components and Applications in Chicago. Two future programs are planned on CO ₂ refrigeration.
	j. Liaison with C-Dig, Eurammon, and other international bodies involved in natural refrigerants.	06/09	None	Hay, Ayub,	Hay established as international organization liaison
	k. Maintain and update the REF website.	01/09, 06/09	None	Staff	Ongoing. See www.ashrae.org/members/page/797
	l. Liaison with TC's on refrigeration related research and programs.	01/09, 06/09	None	Sluga, All REF	Ongoing through TC liaison checklist.
2.	Support Chapter Refrigeration Activities				--
	a. Submit recommendations to incoming President for 2009-2010 Refrigeration PAOE points and emphasize that refrigeration be included in a separate category.	01/09	None	Anderson, Vallort	Complete. Anderson to follow up with Holness and PAOE subcommittee chair on refrigeration activity requirements for PAOE eligibility.

	b. Update list of speakers on refrigeration topics.	01/09	None	Gage, Fricke	
	c. Expand Distinguished Lecturer List to include at least (6) additional experts on refrigeration.	01/09	None	Vallort, Siller	Vallort requested additional nominations from REF.
	d. Publicize refrigeration programs and speakers through Insight announcements.	Quarterly	None	Gage, Bevington, Vallort	Ongoing
	e. Publicize the Milton W. Garland Commemorative Refrigeration Award for Project Excellence, and the Refrigeration Comfort Cooling Award for Project Excellence, through Insight announcements.	Quarterly	\$400	Gage, Bevington, Vallort	Gage submitted article for Insights to coincide with start of CRC schedule to solicit nominations.
3.	Develop a Plan for Sustainable Refrigerated Building and System Design				--
	a. Coordinate the development of an RTAR or Special Project to establish 'Benchmarks for Energy Efficiency and other aspects of Sustainability in Refrigerated Storage Facilities.'	01/09	UK	Scott, Nelson, Ayub	Scott to lead effort in developing proposals for Special Projects Subcommittee. Conference call scheduled for after meeting.
	b. Coordinate the development of an RTAR or Special Project for a 'Design Guide for Energy Efficient, Sustainable Refrigerated Storage Facility.'	01/09	UK	Vallort, Scott, Ayub	Scott to lead effort in developing proposals for Special Projects Subcommittee. Conference call scheduled for after meeting.
	c. Coordinate the development of an RTAR or Special Project for a 'Design Guide for Energy Efficient, Sustainable Refrigeration Systems.'	06/09	UK	Scott, Nelson, Kazachki	Scott to lead effort in developing proposals for Special Projects Subcommittee. Conference call scheduled for after meeting.
	d. Coordinate the development of RTAR's for the research necessary to support the above 'Design Guides.'	06/09	UK	Scott, Nelson, Ayub	Scott and subcommittee to work with appropriate TC's.

ASHRAE Position Document on
Natural Refrigerants
Approved by ASHRAE Board of Directors
January 28, 2009

Executive Summary:

Driven by international agreements such as the Montreal and Kyoto protocols (UNEP 1999 and United Nations 1998) as well as a desire for a higher degree of sustainability, there is a renewed interest in increasing the application of natural refrigerants. The class of refrigerants commonly referred to as “natural refrigerants” offers the potential to improve the environmental performance of refrigeration systems. Because of its alignment with sustainability initiatives, ASHRAE supports research, assessment, and strategic growth in the use of natural refrigerants such as ammonia, carbon dioxide, hydrocarbons, air and water in refrigeration systems and technologies.

Taking a leadership role means ASHRAE and its members will continue to extend the scope of refrigeration and air conditioning technology by conducting research, disseminating knowledge, developing standards and guidelines, and promoting the responsible use of sustainable refrigerants. Several technical committees within ASHRAE are committed to achieve this goal. Limited research has been undertaken within a few ASHRAE technical committees during the past decade with most efforts focused on ammonia and carbon dioxide.

In light of the current global scenario, ASHRAE’s response to the demand for environmental sustainability is to promote the development of systems which use natural refrigerants safely, economically and efficiently.

1.0 Issues

Refrigerants play a vital role in society by their use in systems to preserve food and produce ice, to condition space for human welfare and controlled environments, and to support industrial processes. As world economies grow the application of refrigeration and air conditioning systems also grows, which leads to a proliferation in refrigerant production by virtue of the “banked” refrigerant existing in deployed equipment and a greater quantity of refrigerant needed for servicing and maintenance. Both of these factors result in a greater potential for refrigerant emissions to the environment with the potential adverse impacts. At the same time as the need for refrigerants is growing, the world’s societies are becoming more concerned about the environmental consequences of the refrigerants being used and the systems which use them. Through the Montreal Protocol, the world developed an unprecedented response for the environmental problem of stratospheric ozone depletion by phasing out the manufacture and the eventual use of ozone depleting refrigerants. The primary substitutes for these refrigerants are hydrofluorocarbons (HFCs) but they are greenhouse gases which have been implicated in global climate change. Consequently, options for the reduction of greenhouse gas emissions are now under investigation.

In the search for alternatives which have low Global Warming Potential (GWP) and reduced likelihood of other environmental impacts, natural refrigerants are gaining increased interest. Natural refrigerants are substances that can be found naturally occurring in the environment. Natural refrigerants include ammonia, carbon dioxide, hydrocarbons, water, and air. Some of the natural refrigerants have been used in the market place for many decades although at varying degrees of application. Although environmentally superior, natural refrigerants are not free of other concerns, such as corrosion, toxicity, high pressures, flammability, or in some cases lower operating efficiencies.

Selection of the correct refrigerant for an application requires careful review of such criteria as capital cost, operating cost (including energy and maintenance), equipment size and location, operating temperatures/pressures, facility staff capability and local, national, and international regulations.

The American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) is an international leader in the field of refrigeration and air conditioning. Through its mission to advance the arts and sciences of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world, ASHRAE and its members are uniquely qualified to contribute to the correct advancement of natural refrigerants.

2.0 Background:

Natural refrigerants include a range of organic and inorganic compounds suitable for use in a variety of refrigeration and air conditioning system applications and presenting a variety of issues and challenges. Thus the successful application of these refrigerants will vary depending on the compound. A useful definition is “Natural refrigerants occur in nature's biological and chemical cycles without human intervention. These materials include ammonia, carbon dioxide, natural hydrocarbons, water and air.”

The advantages of natural refrigerants have led to a significant increase in their use in recent years in applications traditionally served by fluorocarbons. For ammonia and hydrocarbons, a major goal of current development is to decrease the refrigerant charge in refrigerating systems in order to address safety concerns. Through careful design, it is often possible to reduce the required quantity of refrigerants in systems by the application of design techniques such as plate heat exchangers and dry expansion evaporators – both of which are already common in a number of applications.

Another way to decrease the refrigerant charge is the use of indirect refrigeration systems with secondary coolants. In these systems the refrigerant is limited to the machine room, and the secondary coolants circulate in the occupied spaces. In addition to traditional secondary coolants, such as glycols and salt brines, new coolants appeared on the market, and particularly beneficial results have been reported with CO₂ as a secondary coolant. These alternatives tradeoff environmental benefits of reduced refrigerant charge with lower system operating efficiency due to the presence of a secondary working fluid.

Another common issue for several of the natural refrigerants is the need to advance the development of system components which can cost effectively achieve desired energy and performance efficiencies.

2.1 Ammonia – R-717

Ammonia is the most important of the natural refrigerants because of its longstanding and widespread use in food and beverage processing and preservation, and because of its growing adoption in HVAC chillers, thermal storage systems, process cooling and air conditioning, district cooling systems, supermarkets, and convenience stores. Since the middle of the nineteenth century there have been many changes in types of refrigerants, but ammonia is unique because it has seen continued use over this 150 year period.

Ammonia has Ozone Depletion Potential (ODP) and GWP equal to zero. It has inherently high refrigeration system energy performance, excellent thermodynamic properties, and high heat transfer coefficients. In a vapor state it is lighter than air. It is easily detected by smell, or by a variety of electrochemical and electronic sensors, and is readily available at a relatively low price. Less than 2 % of all ammonia commercially produced in the world is used as a refrigerant; however, ammonia enjoys low cost due to the large volume of production for use as a fertilizer.

The primary disadvantage of ammonia is its toxic effect at higher concentrations (i.e. = above 300 ppm); however, this risk is somewhat mitigated by its pungent smell alerting humans of its presence since even at lower concentrations (5 ppm) it is self-alarming in the event of a leak. Ammonia is classified in ASHRAE Standard 34 as having “lower flammability ” in air when its concentration ranges between 16 % and 28 % (by weight); and it is not compatible with copper and copper alloys.

In some jurisdictions, ammonia refrigerating systems are subject to legal regulations and standards because of personnel safety considerations. These do not necessarily present additional barriers because legal regulations, proper maintenance and training of personnel are required for other refrigerants as well. Furthermore, the use of fluorocarbon refrigerants is discouraged in many countries with imposition of environmental legislation and taxes, and uncertainty concerning the Kyoto Protocol consideration. If the regulations and standards are applied in practice, and if suitable training for maintenance personnel is provided, then danger from ammonia use is no different from that of most other refrigerants.

Ammonia provides useful cooling across the range of temperatures, from air conditioning to low temperature applications. Some air conditioning systems with ammonia chillers have recently been installed in commercial and public buildings. These units are currently more expensive than fluorocarbon-based chillers, but the price difference is expected to reduce as production volumes increase. A semi-hermetic ammonia compressor is already on the market and will be applied in chillers and in factory-packaged refrigeration units which are used commonly in ice plants and smaller food processing and storage facilities. In order to reduce the potential for ammonia leakage, compact refrigerating units are built, fully sealed and tested in factories, and can be supplied with a charge of less than 50 kg of ammonia for 1000 kW cooling capacity. Lastly, in large industrial systems where there is a need for low temperatures (-30 to -50 °C) ammonia has been used in cascade refrigerating systems with CO₂.

Absorption chillers with ammonia/water mixture are suitable and cost effective for some specific applications, especially using a waste heat, in Combined Chilling, Heat and Power (CCHP) systems and district cooling.

2.2 Carbon dioxide – R-744

Like ammonia, carbon dioxide was also used in the mid- to late-nineteenth century, particularly on board ships and in shops and theatres where the smell of ammonia was not acceptable. However, as ammonia system safety and efficiency improved at the beginning of the twentieth century carbon dioxide systems became less common. With the introduction of fluorocarbons in the 1930s carbon dioxide fell out of use by the 1950s. The low toxicity, non-flammability, zero ozone depletion potential and low global warming potential have attracted the attention of system designers beginning in the early 1990s when alternatives to chlorofluorocarbons (CFCs) were being sought. Since then, carbon dioxide has found widespread acceptance in the full range of vapor-compression systems, from low temperature freezers to high temperature heat pumps. It has also been widely used as a secondary refrigerant, offering significant improvements in efficiency compared with traditional water, glycol or brine systems.

One major difference between carbon dioxide and other refrigerants is in its pressure/temperature characteristic because the pressures experienced are approximately ten times higher than those in ammonia or R-404A systems. This high pressure requires special equipment designs, but it also offers many advantages over other refrigerants. The high pressure results in high gas density, which allows a far greater refrigerating effect to be achieved from a given compressor. It also produces very small reductions in saturation temperature for a given pressure drop allowing higher mass flux in evaporators and suction pipes without efficiency penalties. This effect is particularly noticeable at low temperatures (-30 to -50 °C), which is why carbon dioxide systems perform so well under these conditions. Exceptionally good system performance has been noted in low temperature plate freezers and multi-chamber blast freezers where improvements in efficiency and reductions in freezing time have been reported.

When the pressure is raised above the critical point (7.3773 MPa) it is not possible to condense carbon dioxide. Under these conditions heat rejection is achieved by cooling the very dense gas which results in a temperature glide effect. This has been used to great advantage in water-heating heat pumps for a range of applications from domestic to industrial. These trans-critical heat pumps are particularly efficient when the

incoming water is low temperature, for example from the cold water supply. They are less effective over a small temperature range, for example in central heating systems.

The unusual fluid properties of carbon dioxide, including its high density and low critical point, make it particularly well suited for cooling very dense heat loads, such as those found in Information Technology applications like blade servers and trader rooms. The optimal temperature for transferring heat to carbon dioxide is 14 °C, which happens to be exactly the evaporating temperature required for IT cooling in order to avoid dehumidification. In comparison the optimum temperature for R-134a is 77 °C, and at 14 °C the heat transfer capability of R-134a is only one-sixth of carbon dioxide.

Carbon dioxide is proposed as a good alternative for car air conditioning. The German Association of the Automotive Industry (VDA 2007) has confirmed the joint decision of the German car industry to choose carbon dioxide for the next-generation of mobile air conditioning by 2011.

Today there are many trans-critical carbon dioxide systems in supermarkets. For about 90 % of the year the Coefficient of Performance (COP) of systems with carbon dioxide is higher than in HFC systems. This is the reason that it is an attractive choice for beverage cabinets and vending machines.

The carbon dioxide used as a refrigerant is generally of industrial or scientific grade, and is typically recovered from the waste streams of industrial processes. The embedded energy required to reclaim, clean, liquefy and transport carbon dioxide is estimated to have a carbon equivalent of 1 kg CO_{2eq} per kg. In contrast the ammonia production process has a carbon equivalent of 2 kg CO_{2eq} per kg and for fluorocarbons this is typically about 9 kg CO_{2eq} per kg.

2.3 Hydrocarbons

In nature, hydrocarbon refrigerants are constituents of oil and natural gas. Hydrocarbon refrigerants have excellent environmental, thermodynamic, and thermo-physical properties, however they are highly flammable. As a result of these factors, hydrocarbons are the molecular basis for the halocarbon refrigerants wherein some or all of the hydrogen atoms have been replaced by halogens such as chlorine, fluorine, and bromine which reduce flammability but can cause unwelcome effects on the environment.

Hydrocarbon refrigerants provide a range of boiling points with applicability from cryogenics to air conditioning. In the past hydrocarbon refrigerants have had limited applications primarily within the petrochemical industry to provide industrial chilling and process refrigeration. With the phase out of the CFCs, hydrocarbon refrigerants are entering into new arenas. One of the first uses has been as a small quantity constituent in halocarbon blends to provide enhanced thermo-physical properties, such as oil miscibility. For the last decade in the European and Asian countries, the commercial market for systems using hydrocarbon refrigerants has been growing as a result of concerns about the environmental consequences of the halocarbon refrigerants. Examples of commercially available equipment using hydrocarbon refrigerants are:

- systems with small charges including domestic refrigerator/freezers and portable air conditioners,
- stand-alone commercial refrigeration systems including beverage and ice-cream machines,
- as the primary refrigerant in centralized indirect systems for supermarket refrigeration,
- transport refrigeration systems for trucks, and
- chillers in the range 1kW – 150 kW (0.3 – 40 tons of refrigeration)

The hydrocarbons most commonly used as refrigerants are:

Methane	R-50
Ethane	R-170
Propane	R-290

Butane	R-600
Isobutane	R-600a
Ethylene	R-1150
Propylene	R-1270

2.4 Water- R-718

Water is another natural refrigerant with a renewed interest because it is non-toxic, non-flammable low cost, and abundant. Water is widely used as a refrigerant in higher temperature lithium bromide – water (LiBR-H₂O) absorption chillers where water is the refrigerant and lithium bromide is used as an absorbent. The challenge for absorption chillers is that even a double- effect absorption cycle only has a COP (Coefficient of Performance) slightly greater than 1. As a comparison electric drive centrifugal chillers have a COP greater than 5.

It is far less common to find water in use within a vapor compression refrigeration system, although it does have one particularly noteworthy attribute – its thermo-physical properties enable it to achieve a high coefficient of performance. R-718 systems present a number of technological characteristics that have, to date, limited their growth into the industry. First, the operating pressures for water-based refrigeration systems are extremely low – approaching a near perfect vacuum making their continued operation free of contaminants (air) difficult. Second, the density of water vapor is extremely low; thereby, necessitating compressors capable of processing extremely high volume flow rates. Lastly, water is inherently limited to refrigeration applications for high temperature only. However, developments at the proto-type level in the vapor compression-based R-718 systems continues and is paving way for the introduction of chillers in large sizes that could become a significant part of the chiller and ice-water markets.

2.5 Other

In addition to carbon dioxide, air and some of its constituents are used as refrigerants in niche industrial applications. As with carbon dioxide, pressure and efficiency considerations are important criteria for selection. Liquid nitrogen in direct contact freezing is not considered to be a natural refrigerant because the embedded energy required for the production and transport of the liquid is so high.

Recommendations:

Through its Strategic Plan, ASHRAE has recognized that the advancement of sustainable building design and operations is critical to the protection of our global environment and to society. Expanding the safe and efficient application of natural refrigerants supports this move towards sustainability and continues ASHRAE's legacy as an international leader in the field of refrigeration and air conditioning.

ASHRAE holds a strong position that:

- the use of natural refrigerants helps to meet growing HVAC&R demands in a sustainable manner
- there are still research needs in order to achieve this in a safe, cost-effective, and environmentally beneficial manner
- projects must be assessed in a rational, fact-based, systematic manner to ensure that environmentally beneficial technologies are not rejected on the basis of false information or irrational fears.

ASHRAE recommends that further research be conducted on

- safety, energy efficiency, costs and environmental impact for all refrigerants using a consistent and comprehensive methodology
- the development of systems and components which can ensure the safe application of natural refrigerants without compromising energy efficiency
- the behavior of natural refrigerants in operating systems

- the role of natural refrigerants in achieving sustainability

ASHRAE is committed to

- the application of natural refrigerants
- the development of strategic relationships to advance natural refrigerants
- the consideration of natural refrigerants in existing and new guidelines, codes and standards
- the provision of guidance and education to policy makers and the public
- the creation and dissemination of methods and tools for environmental assessment of refrigeration systems
- the publication of technical information highlighting best practices from a safety, reliability and efficiency standpoint
- the promotion of authoritative information on natural refrigerants through seminars and publications

References

- UNEP, 1999. The Montreal Protocol on Substances That Deplete the Ozone Layer. Ozone Secretariat, United National Environment Programme. <http://www.unep.org/OZONE/pdfs/Montreal-Protocol2000.pdf>
- United Nations. 1998. Kyoto Protocol to the United Nations Framework Convention on Climate Change. <http://unfccc.int/resource/docs/convkp/kpeng.pdf>
- VDA (Verband der Automobilindustrie; German Association of the Automotive Industry). 2007. <http://www.vda.de/en/meldungen/archiv/2007/09/06/1690/>
- ASHRAE Handbook: Fundamentals - Refrigerants
- ASHRAE Handbook: Fundamentals – Thermo-physical Properties of Refrigerants
- ASHRAE Handbook: Refrigeration - System Practices for Ammonia and Carbon Dioxide Refrigerants
- ASHRAE Standard 15 - Safety Standards for Refrigeration Systems
- ASHRAE Standard 34 - Designation and Safety Classification of Refrigerants
- ASHRAE Position Document: Ozone Depleting Substances
- ASHRAE Position Document: Climate Change
- ASHRAE Position Document: Ammonia as a Refrigerant

- B3.11 Annually, determine the winner of the George Briley ASHRAE Journal Award using the procedures given in ~~Appendix F~~ the REF Reference Manual.

~~APPENDIX F~~

PROCEDURE FOR GEORGE BRILEY ASHRAE JOURNAL ARTICLE AWARD

1. PURPOSE.

The purpose of the George Briley ASHRAE Journal Article Award is to recognize annually an individual for his/her excellence in contribution to the ASHRAE Journal with an article(s) related to refrigeration. The award will serve to heighten general membership awareness of, and interest in, Journal articles related to refrigeration.

Fellow/Life Member ASHRAE member George C. Briley, P.E. is an exceptional ASHRAE member. He has made significant contributions to the ASHRAE Journal. Mr. Briley has published nearly thirty articles related to refrigeration applications in the ASHRAE Journal, including a stretch of two years with an article on various refrigeration applications each month.

2. AWARD PRESENTATION.

The George Briley ASHRAE Journal Article Award shall be presented annually but may be omitted if a suitable candidate is not identified. The award will include the recipient's name and the year.

3. ELIGIBILITY.

The award is open to ASHRAE members who have published at least one refrigeration related article in the ASHRAE Journal over the past Society Year. Current REF members are not eligible for receipt of the George Briley ASHRAE Journal Article Award.

4. NOMINATION.

~~A nomination for the George Briley ASHRAE Journal Article Award is made by completing a nomination form that outlines the refrigeration related contributions that the nominee made to the ASHRAE Journal. The nominator submits the nomination to the REF chair by September 1.~~

54. JUDGING.

~~After each Annual Meeting, ASHRAE Staff will review the previous Society Year's ASHRAE Journal and compile a list articles related to refrigeration. These will be sent to the REF chair. An assigned REF member reviews all nominations received and to identify forwards eligible articles. nominees to REF for REF's its consideration. The chair will appoint a subcommittee of REF to judge the articles prior to each ASHRAE Winter Meeting. The rating form shown below shall be used for judging the articles with the highest total score winning the award. Prior to the ASHRAE Winter Meeting, REF shall determine the winner.~~

65. PRESENTATION

During the ASHRAE Annual Meeting, the George Briley ASHRAE Journal Award is presented at the REF Committee meeting.

<u>George Briley Journal Article Award</u>				
<p><u>Rating Articles: Please rate the issue's articles using the following scale:</u> 5 = excellent, 4 = very good, 3 = good, 2 = adequate, 1 = poor</p> <p><u>Provide comments for each article as appropriate</u></p>				
<u>Title</u>	<u>Technical Content</u>	<u>Quality of Presentation</u>	<u>Usefulness of Information</u>	<u>Average Score</u>
<u>Vol. 49 No. 08 - Heat Recovery in Industrial Refrigeration</u>	-	-	-	
	<u>General Comments:</u>			
<u>Vol. 49 No. 09 - Supermarket Refrigeration System with Completely Secondary Loops</u>	-	-	-	
	<u>General Comments:</u>			
<u>Vol. 49 No. 10 - Integrating Alternative and Conventional Cooling Technologies</u>	-	-	-	
	<u>General Comments:</u>			
<u>Vol. 49 No. 10 - Mechanical Integrity and Carbon Steel Refrigerant Piping</u>	-	-	-	
	<u>General Comments:</u>			



**INSTRUCTIONS
NOMINATION FORM
ASHRAE DISTINGUISHED LECTURER PROGRAM**

Revised October 2008

Distinguished Lecturer Nominations are due at ASHRAE Headquarters **December 1** for review by the Chapter Technology Transfer Committee at the Society Winter Meeting or **May 1** for CTTC review at the Society Annual Meeting.

The ASHRAE Distinguished Lecturer Nomination Form, a current resume or ASHRAE Biographical Record, and an abstract (brief synopsis) of the candidate's proposed presentation (s) must be provided to ASHRAE electronically. **Email the completed nomination in Adobe pdf format to:**

Staff Liaison, Chapter Technology Transfer Committee
ASHRAE
1791 Tullie Circle, N.E.
Atlanta, GA 30329
rdouglas@ashrae.org

The ASHRAE Distinguished Lecturers Program was established in Society year 1996-97. The purpose of the program is to provide ASHRAE chapters with lecturers equipped to speak on relevant subjects of interest to ASHRAE members and guests. The program provides local ASHRAE chapters, student branches, neighboring universities and colleges, and other organizations the opportunity to collaborate and hear outstanding speakers on the leading edge of technology.

DL candidates must be recommended by an ASHRAE member, or ASHRAE staff, using the Distinguished Lecturer Nomination Form. The candidate must be an effective presenter who will appeal to a mixed audience of technical and non-technical people having interest in current and emerging issues of technical and societal importance. It is presumed that candidates will have expertise in their particular field (as demonstrated through years of experience and speaking and/or publishing on a particular topic).

At the beginning of each year, Chapter Technology Transfer Regional Vice-Chairs shall select the chapters in their region to host Distinguished Lecturers. The number of chapters in each region who may participate in the program will be based upon available resources for the year, as determined by Members Council.

Distinguished Lecturers shall commit to a two-year, renewable term and agree to at least two speaking engagements per year, if requested to speak. Lecturer reimbursement will be in accordance with the Expense Reimbursement Policy for the Distinguished Lecturers Program in effect for the current fiscal year. A speaker's honorarium, if any, will be the responsibility of the local ASHRAE chapter.

Criteria for the selection of Distinguished Lecturers include the following:

- Does not have to be an ASHRAE member
- Must present timely, relevant topics of interest to ASHRAE members and guests
- Other considerations include recognition such as ASHRAE Fellow, Ph.D., books authored, peer recognition, excellent presentation skills, etc.
- Must be recommended by an ASHRAE member or ASHRAE staff using the Lecturer Nomination Form
- Must submit a current ASRAE biographical Record or resume with pertinent data on education, experience, publications, etc.
- Must submit written abstract (brief synopsis) of proposed presentations
- Must agree to serve for a two-year term and speak at a minimum of two chapter meetings per year

ASHRAE DISTINGUISHED LECTURER NOMINATION FORM

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Atlanta, GA 30329
[**rdouglas@ashrae.org**](mailto:rdouglas@ashrae.org)



NAME OF PROPOSED LECTURER:

Address:
Phone:
Email:

TOPIC (S) PROPOSED LECTURER WOULD ADDRESS (Please provide an abstract (brief synopsis of each proposed presentation):

I have _____ have not _____ confirmed with the proposed lecturer whether he/she would be willing to serve, if asked.

NOMINATOR’S CERTIFICATION

I have personally heard the candidate make formal presentations. It is my opinion that the candidate is an effective presenter and will appeal to a mixed audience of technical and non-technical people having interest in current and emerging issues of technical and societal importance. I believe the candidate will be an excellent public representative of the principles of ethical and professional practice for which ASHRAE stands.

NOMINATION SUBMITTED BY:

Name:
Address:
Phone:
Email:



CHECKLIST
FOR ASHRAE DISTINGUISHED LECTURER NOMINATION

- Is the Distinguished Lecturer Nomination Form completed?
- Is the candidate’s current ASHRAE Biographical Record or resume attached?
- Is an abstract (brief synopsis) of the candidate’s proposed presentation (s) attached?
- Nomination submitted by the **December 1** deadline?
- Or**
- Nomination submitted by the **May 1** deadline?

ASHRAE Refrigeration Speakers List

Name	Topic*	Organization	Chapter	Travel?	Honorarium?
Region I					
Martin Timm	Safe Use of CO2 and Liquid Nitrogen as Refrigerants	Praxair Inc.	Niagara Frontier (Buffalo, NY)	Yes	None for short distances.
Region II					
Ted Martin	Energy Efficient Ice Rinks, Ski Slopes and Luge Runs	CIMCO	Toronto		
Region III					
Mike Gaza	VFD's and Motor Control	Schneider Electric and HVAC/R and Pumping	Lehigh Valley (Allentown, PA)	Yes	
John Ansbro	Ammonia Chillers	Johnson Controls/Frick	Baltimore	Yes	None
	Low Charge Ammonia Chillers				
John Kollasch	Evaporative Condensers	EVAPCO, Inc.	Central Pennsylvania	Yes	None
Region IV					
Georgi Kazachki	Conceptual and Design Considerations for "Green" Unitary, Distributed, & Centralized DX & SC Refrigeration & AC	Cryotherm	Atlanta	Yes	\$2,000 plus travel
	Refrigerants, Secondary Coolants & Components in Synergy for Efficient & Trouble-free Operation of Unitary, Distributed, & Centralized DX & SC Refrigeration & AC				
	Troubleshooting –The Art of Revealing a Violated Synergy in Refrigeration & AC Units & Systems.				
Region V					
Region VI					
Doug Reindl	Industrial Refrigeration Systems	University of Wisconsin - Madison	Madison (WI)	Yes	Travel Reimbursement
	Safety Including: PSM, ASHRAE Standard 15				
Danny Halel	Supermarket Refrigeration Systems	Hussman Corp.	St. Louis	Yes	None for local travel. Travel

Name	Topic*	Organization	Chapter	Travel?	Honorarium?
	Energy Savings Techniques for Commercial Refrigeration systems				expenses outside local area.
Ron Vallort	Project Management and Design of a Refrigerated Warehouse	Vallort & Associates	Illinois		None
	The Future of Refrigeration				
	Refrigeration Load Calculations				
	Project Management and Design of a Food Processing Plant				
Region VII					
Region VIII					
Zahid Ayub	Heat Exchangers	Isotherm	Dallas	Yes	
	Low Charge Chillers and Condensers				
Donald Hay	The application of VFDs with Refrigeration Compressors	TECSIR	Monterrey, MX	Yes	None
	2010 Winter Olympics Heat Recovery Project				
Region IX					
Don Fenton	An Overview of the ASHRAE 15 User's Manual	Kansas State University	Kansas City	Yes within driving distance	None
Region X					
Region XI					
Bent Wiencke	Two-Phase Flow and Gravity Liquid Separators	Nestle USA	Puget Sound (Seattle, WA)	Yes	None but possibly travel cost reimbursement
	Hydraulic Shock Phenomena				
Jim Conant	Energy Management with Microprocessor Controls in Industrial Refrigeration	LOGIX	Seattle	Yes	None
	Electronic Control Systems for Industrial Refrigeration				
Region XII					
Arthur Garbarino	Ultra-low Temperature	Air Service Inc.	Gulf Stream (West Palm)		

Name	Topic*	Organization	Chapter	Travel?	Honorarium?
	Cryogenics		Beach, FL)		
Jeff Welch	Thermosiphon System Design	Freeze-Pro Inc.	Jacksonville	Yes	None for local travel. Travel expenses outside local area.
Region XIII					
Region At Large					
Anders Lindborg	Risk Analysis for Ammonia Refrigeration	Ammonia Partnership AB	Subregion B (Sweden)	Yes	Travel Reimbursement
	Ammonia Refrigerant Spills				
Dr. Andy Pearson	Ammonia	Star Refrigeration	Subregion C (UK)	Yes	Contact Lecturer
	Carbon Dioxide				

* Blue = Industrial Refrigeration
 Yellow = Commercial Refrigeration
 Green = Both

Sustainable Refrigerated Warehouse and Refrigeration System Design
2008-2009 Refrigeration Committee Objectives 3a, 3b, 3c, 3d

Actions to Date:

1. Distributed preliminary notes and discussed at September 8 conference call.
2. Requested comments and input. Received comments from Ron Vallort concerning 3b.
3. Kent Anderson advanced the design guide(s) and related refrigeration topics during Tech Weekend in October, resulting in recommendation of the Special Projects mechanism, rather than RTAR. The Advanced Energy Design Guide series may also provide ideas. There is strong support for this effort.
4. Next step is to submit a Special Projects Application to the Special Projects Subcommittee.

3a – Benchmarking (TC 10.5):

“Benchmarks for Energy Efficiency and other Aspects of Sustainability in Refrigerated Storage Facilities”

- Additional work done on technical methods for benchmarking (as discussed in original notes).
- Existing benchmarking tool (high level) done by UC Davis, PIER.
- Objectives in California (PG&E, others) to develop benchmarking (and other efforts) for refrigerated warehouses in 2009-2010.
- 10.5 may have more information.

3b – Design Guide for Refrigerated Storage (TC 10.5):

“Design Guide for Energy Efficient, Sustainable Refrigerated Storage Facilities.”

- Additional work done on content.
- 10.5 may have more information.

3c – Design Guide for Refrigeration Systems (TC 10.1):

"Design Guide for Energy Efficient, Sustainable Refrigeration Systems."

- Additional work done on expected content and design methods.
- Rapid change occurring on HFC front; dictating more attention to low GHG options.

Special Projects approach:

Direction is needed from REF on the preferred approach to producing the Design Guides, in order to develop the proposal to Special Projects Subcommittee.

The content in the existing ASHRAE Green Guide was the result of volunteer efforts.

Questions: Who do we want to manage, fund, participate, etc? Is the content provided by one or many? Special Projects are presumably more flexible than the RTAR path and undoubtedly REF can guide the general approach.

- One approach could be to specify the requirements, with a single contractor performing the work, either directed by ASHRAE or through bidding.
- Another approach would be to specify the requirements and only fund an Editor and select work tasks (e.g. data gathering, analysis, targeted investigations), with the bulk of the technical document being provided by volunteer contributors.
- Contribution from other organizations, either information or content or funding may be more forthcoming and accessible with the second approach.

3d – Allied Research (TC 10.1, 10.5, 10.8):

Development of RTAR's for the research necessary to support the above "Design Guides."

Research topics will be discussed at joint Research Subcommittee meeting Sunday 5-7 PM.

Schedule:

Determine what is feasible and agree on approach for Special Project(s) by 3/1/09

Complete draft Special Projects Submittal Forms by 5/15/09

Identify additional contributors and funders (as applicable) by 7/1/09