ASHRAE TC ACTIVITIES SHEET

DATE: June 2003
TC NO. TC 1.5   **TC TITLE: Computer Applications**
CHAIR: W. Grondzik   **VICE CHAIR/SECRETARY: M. Hydeman**
TC 1.5 MEETING ATTENDANCE

Name	Affiliation	Email	TC	Research	Program	Emerging Aps.	Handbook	Internet
Bruce Billedeaux	Armstrong Service. Inc.		X	X	X	X		X
Al Black	McClure Engineering Associates		X					
David Bornside	Siemens Building Technologies		X					
J. Patrick Carpenter	Kling		X					
Charlie Culp	Texas A&M		X	X	X			
Tim Dwyer	South Bank University London		X	X	X	X		X
Cliff Federspiel	UC Berkeley					X		X
Mike Galler	NIST		X	X	X	X	X	X
Krishnan Gowri	PNNL		X	X	X	X		X
Walter Grondzik	Florida A&M University		X			X		X
Jeff Haberl	Texas A&M			X	X			
Rob Hitchcock	Lawrence Berkeley National Lab		X	X	X	X		X
Alison Kwok	University of Oregon		X	X	X	X		X
Dennis Landsberg	Landsberg Engineering PC		X					
Ron Nelson	Iowa State University		X	X	X			
Bob Old	Siemens Building Technologies		X	X	X	X		X
Michael Pouchak	Honeywell, Inc.		X					
Nick Rajkovich	Einhorn Yaffee Prescott		X			X		X
Mick Schwedler	Trane		X	X	X	X		X
Pornsak Songkakul	Siemens Building Technologies		X	X	X	X		X
James Watts	Ingersoll-Rand Energy Systems		X	X	X	X		X
Wayne Webster				X	X			

TC MEETING SCHEDULE

Location, past 12 mo.	Date	Location, next 12 mo.	Date
Chicago	Jan 2003	Anaheim	Jan 2004
Kansas City	Jun 2003	Nashville	Jun 2004

TC SUBCOMMITTEES

Subcommittee	Chair
Emerging Applications	Pornsak Songkakul
Handbook	Mike Galler
Internet	Rob Hitchcock
Program	Krishnan Gowri

Research	James Watts

RESEARCH PROJECTS

Project Title	Contractor	Monitoring Committee Chair	Report Made at Meeting?
TRP 1228	Scientific Computing	Dave Branson	No
TRP 1049		TC 4.7	Yes
TRP 1032	PECI & Marinsoft	Dave Branson	No

LONG RANGE RESEARCH PLAN

Rank	Title	W/S Written	Approval	To R&T
1	Prototype demonstration of IFC/aecXML interoperability in support of HVAC&R activities.	Yes	Yes	Yes
2	On-line development of standards	No	No	No
3	Retooling the HVAC education process to better Use Computer-Aided Design	No	No	No
4	A Multimedia database for examining and comparing HVAC design alternatives	Yes	No	No
5	Software tool to aid the development of work statements that have software deliverables	No	No	No

HANDBOOK RESPONSIBILITIES

Year & Volume	Chapter Title	No.	Deadline	Approval	Handbook Committee Liaison
2007 HVAC Applications	Computer Applications	38	3-8-2007		Gary Debes, (gary.debes@mail.ashrae.org)

STANDARDS ACTIVITIES

None

TECHNICAL PAPERS FROM SPONSORED RESEARCH (PAST 3 YRS, PRESENT, PLANNED)

Title	When Presented
1017 RP (Akleman and Haberl) – Jim Watts	Chicago (1/03)
1032 TRP - Interoperable Computer Applications – Dave Branson	Chicago (1/03)

TC SPONSORED SYMPOSIA (PAST 3 YRS, PRESENT, PLANNED)

Title	When Presented
Web based computer applications for Now	Future
Computers in HVAC Education - Nelson/ONiel	Future
Interoperable Computer Applications – Branson	Chicago (1/03)
Symposium AC-02-9: Tools and Techniques for Calibration of Component Models - Agami Reddy	Atlantic City 1/02

TC SPONSORED SEMINARS (PAST 3 YRS, PRESENT, PLANNED)

Title	When Presented
Network Applications of Internet, Intranet and Building Automation – Pouchak	Future
We are not alone in the universe emerging applications around the world – Forrester	Future

Methods for exchanging / integrating data among different HVAC & Control systems and business information systems - Pornsak	Future
Seminar.com: Potential & Pitfalls of Moving Business to the Internet - Grondzik	Future
Internet based training - Grondzik	Future
Emerging Internet Technologies Bring New Business Opportunities - Dunn, Wayne	Future
A Day in the life of ASHRAE members in the YEAR 2010 - Culp	Future
Cool Stuff that ASHRAE Could be Doing Using the Internet - Grondzik	Future
Next generation of AEC application development - Songkakul	Future
Establishing Cost Effective Energy Baselines for Measurement and Verification	Kansas City (6/03)
Computer Security – Pouchak	Chicago (1/03)
Apply measured data to measurement and verification – Pornsak	Chicago (1/03)
Tools and Techniques for Sustainable Design – Dwyer	Chicago (1/03)
Experiences with Electronic Collaboration on the Teamwork 2001 Project - Dwyer/Branson	Chicago (1/03)
Terms that your new engineer knows, but you don't - Schwedler	Honolulu (6/02)
Internet technology for HVAC/R business Use IT or lose it - Dwyer	Honolulu (6/02)
Self-Configuring Control Systems: Needs, Technology and Potential Benefits - Mike Brambley	Honolulu (6/02)
Seminar 14: Uses and Benefits of Electronic Collaboration, Newsrooms and Groupware - Mike Pouchak	Atlantic City 1/02
Seminar 46: Pattern-Recognition-Based Fault Detection and Diagnostics for Building Operation - Mike Brambly	Cincinnati 6/01
Seminar 18: Internet for Global Working - Tim Dwyer	Cincinnati 6/01
Seminar 35: Future NET Gains for the AE Office - Brian Kammers	Cincinnati 6/01
Seminar 27: Interoperable Computer Applications for the HVAC Industry - Mark Hydeman	Atlanta 1/01

TC SPONSORED FORUMS (PAST 3 YRS, PRESENT, PLANNED)

Title	When Presented
Collaborative Web Based Benchmarking - Norford	Future
How Secure is your Wireless Office Place	Kansas City (6/03)
Should ASHRAE Establish Guidelines for Electronic Media that Contains Manufacturer's Product Information? - Grondzik	Chicago (1/03)
ASHRAE Research Developed Software: Should it be free? – Hydeman	Chicago (1/03)
Forum 28: What Does the ASHRAE Membership Need from the Computer Applications Handbook? - Mike Pouchak	Atlanta 1/01

JOURNAL PUBLICATIONS (PAST 3 YRS, PRESENT, PLANNED)

Title	When published
What HVAC Applications Would Benefit from Computer-Aided Instruction - Culp	TBD

SUBMITTED BY: Mark Hydeman-- TC 1.5 Secretary

TC1.5 Computer Applications Main Meeting

Meeting Schedule

- Main TC 1.5 6:30-9:00 Washington 1, (Westin)
- Internet/Emerging Apps 5-6:30 PM Sunday Suite 3722 (Hyatt)
- Program/Research S/C 6:30-8:30 PM Suite 3722 (Hyatt)
- Handbook S/C 6-6:30 PM Monday Washington 1(Westin)

Main Committee Agenda

Call to order 6:35 p.m.

Quorum: Grondzik, Galler, Dwyer, Pouchak, Watts, Gowri, Hitchcock, Songkakul and Schwedler

Motion to approve Chicago Minutes: Moved by Songkakul, Seconded by Watts. Motion passed 9-0-0 Chair not voting.

Chair's Report - Grondzik

- ASHRAE approved the TC 2.8 "Green Guide". Concerns guidelines to allow designers to create more environmentally friendly. This will be published as a Special Publication.

- Handbook chapter is updated on 4-year cycle. The CD basis for upgrades is yearly.

- Input needed from this TC on "Building Health and Safety under Extraordinary Incidents".

- TC members asked to attend Product show at Anaheim.

- Tutorial for ASHRAE web pages for Web masters is posted on the ASHRAE web site

- A "Laptop Lane" Printer is available to TC members on a trial basis outside the Headquarters Office.

- Realignment of Sections. TC 1.5 stays in section 1 group.

- TC 1.7 was named "TC1.7 Business, Management and General Legal Education

- The new TC 1.5 roster for coming year is effective after this meeting.

- Meeting in Scotland Industry September 24-26, 2003.between the Chartered Institution of Building Service Engineers (CIBSE) & ASHRAE for "The Worldwide CIBSE/ASHRAE Gathering of the Building Services."

- Meeting in Washington DC August 17-22, 2003 for 21st International Institute of Refrigeration (IIR) International Congress of Refrigeration.

- Walter circulated a sign up sheet to receive a thank you letter from the ASHRAE President written to member's employer.

- TC 1.5 Membership has substantial changes effective after this meeting. Mark Hydeman will be chair. Rob Hitchcock will be secretary/vice chair. Bruce Billedeaux will be chair of Internet subcommittee.

Action Item Review:

- Jim Watts distributed of TAMU unsolicited proposal "Development of Courseware for Cost Effective and Efficient Conversion of ASHRAE Handbook to a Multimedia eBook" to TC members for comment.

Support of the unsolicited proposal, "Development of Courseware for Cost Effective and Efficient Conversion of ASHRAE Handbook to a Multimedia eBook" moved by Watts, seconded by Galler. Motion failed, 2-4-1 chair not voting. Opposing votes comments: Comment1: Do not think deliverable will help membership develop animations for eBook. Comment2: The proposal would appear to put forward a scheme of work that would have no longevity—the output would necessarily rely on expertise in the use of software tools. These tools are in a fast moving market and would inevitably be outmoded quickly. Funding may be better allocated to a dedicated ASHRAE multimedia support effort. Comment3: Even with the courseware, I think the average ASHRAE member will not be able to take what has been taught in the courseware and create the e-media as explained in the proposal.

- Walter wrote a letter to GPC 20 to encourage progress is done. GPC 20 response is that they are making progress.

- Walter wrote a letter to Underwood to offer help with Electronic Handbook is done. No response received yet.

- Walter has confirmed that all voting members have agreed to allow posting of Email address on Web site.

Subcommittee Reports

Programs - Gowri

See Attachment:

Kansas City:

i. Seminar 18 Establishing Cost Effective Energy Baselines for Measurement and Verification

Move to post Seminar 18 presentation: Moved by Songkakul seconded by Schwedler. Motion passed, 9-0-0 Chair not voting.

ii. Forum 14:

How Secure is your Wireless Office Place – Pouchak . Main speaker does not want material posted.

Anaheim Program Proposals-

i.   Seminar- Computer tools- Dwyer

ii.   Seminar- Emerging Web Apps- Hitchcock

iii.   Forum -Global Virtual Participation – Dwyer

iv.   Seminar- Software from Far Away- Forester

v.   Forum – Are We Ready to use Web Services for Controls – Gowri

Program chairs to submit Ranking.

Motion to accept program proposals. Moved by Gowri, seconded by Hitchock. Motion passed, 9-0-0 CNV.

Gowri to issue a call for papers for Symposium "Web based computer applications for Now". Target for Nashville or later (Orlando).

Research – Jim Watts

See Attachment:

Present Research was discussed.

4 RTARS from Last Year distributed. 1st page to be removed.

Motion to accept work Statement after removal of TC priority 1 & 2 and shift priority 4 priority to 1. Moved by Schwedler 2nd by Songkakul   . Motion passed 9-0-0 Chair not voting.

Emerging Applications/ Internet - Songkakul

See Attachment:

New Chair is Bruce Billedeaux.

Research and Program ideas passed on. A few new programs and research were discussed.

Handbook - Galler

Latest Handbook was released with the new Chapter 39 Computer Applications. Mike Pouchak gave an overview of the new enhancements. There was broad consensus that Mike did an outstanding job (secretary pro tem summary).

Action : Incoming chair verify information that handbook chapter 16 was assigned to TC 1.5 and if verified then strongly recommend TC 1.5 is the incorrect committee and that TC 9.9 is the preferred choice.

Standards

Dave Bornside gave an update on the Graphics Systems Standards went through 2nd public review. David summarized that this revision was a drastic reduction in content. Finalized for publication pending approval.

Web Page – Nelson

Updates to Ron Nelson. Subcommittee chairs to review their portions of the web site.

Gowri suggested those seminar and program chairs to provide content to Nelson. Culp mentioned that session chair should proactive and getting permission from speakers. Speakers may want to put copyright notices on individual slides. Asking the authors permission is the right thing to do. Permission in writing / email is good.   Next get a motion from TC for posting.

Liaisons

GPC20 – Hitchcock

GPC 20 met Sun 8-Noon. Good Attendance. Some actions not followed up on.   Named a Designated Deadline monitor (Mark Palmer) for deadlines.   Estimated delivery date for product for Public review is Feb 2005. Sept 2003 telecon is planned to advance progress.

SPC 134P Symbols – Bornside –Standard is going out for letter ballot for public review 3 or publish.

IAI – Hitchcock – IAI is active. May 2003 in DC meetings held including IAI industry day. Full day of presentations and demos attended by 200 people, mostly Federal Agencies.   IFC data model IFC2x2 released in HTML format. Building Services 8 project included IFC2x2 significantly enhances HVAC part of IFC release. A users group was formed including Carrier, Timberline, NIST, and National lab people.

Ad-Hoc Committee on ASHRAE website- no update

Old Business

New Business

Confirmed meeting times for Anaheim

. Schwedler moved that Mark Hydeman select restaurant for Anaheim 2nd by Hitchcock. 9-0-0 Chair not voting

Electronic Handbook was discussed.   A consensus for an ad-hoc group analyze includes Watts, Billedeaux, Dwyer, Galler, Landsberg, Schwedler

Schwedler asked for the TC to commend Grondzik for his chair leadership of TC 1.5. (Thunderous Applause).

Vern Peppers reported Handbook editor Mark Owens on Handbook committee for Anaheim. Vern Peppers is a representative from TC 1.1 and is working with – turned over to professional to do.

Motion to Adjourn Songkakul, 2nd Galler. Unanimous. Meeting ended.

TC 1.5 Computer Applications
Research Subcommittee Meeting Minutes
ASHRAE Summer Meeting, Kansas City, MO
Sunday, June 29, 2003

1. Call to Order/Introductions

The meeting was called to order at 18:28.

2. 1049 RP Report - "Building System Design Synthesis and Optimization"

Ron Nelson (TC1.5's liaison to the RP sponsoring TC4.7) reported that good progress is being made. The vendor has so far developed a configuration program that can develop simple HVAC systems that equal results generated manually. Ron expects the project to be competed within a year.

3. 1032 RP Report - "Identification and Computer-Based Preservation of Building Design and Commissioning Information"

No report available.

4. 1228 RP Report - "Case Studies of ASHRAE Software Projects Using 'The Software Guide'" (966 Follow-up)

No report available.

5. 1295 WS - "Prototype Demonstration of IFC / aecXML Interoperability in Support of HVAC&R Activities"

The work station has been reworked, Robert Hitchcock put together an excellent cover letter describing how this work statement complements GPC20's efforts, and the package has been submitted for RAC's consideration during this meeting.

6. Unsolicited Proposal - "Development of Courseware for Cost Effective and Efficient Conversion of ASHRAE Handbook to a Multimedia *eBook*",

Ergun Akleman & Frederic Parke & Jeff Haberl, Texas A&M University submitted this URP to ASHRAE and RAC has asked TC1.5 to review the URP and make a recommendation. Jim Watts passed out a scanned document of the first twelve pages of the URP and asked the committee members to review before tomorrow's main TC1.5 meeting. TC1.5's members will be asked to vote on the URP at that time.

7. Proposed Research

The Internet/Emerging Applications subcommittee described two research ideas: 1) Bruce Billedeaux described a project to develop a "spider" and report generator that would collect useful information from ASHRAE –generated content and 2) Krishnan Gowri suggested a survey and report on state-of-the-art web applications.

Charlie Culp suggested that when TC1.5 considers new research ideas they should remember that computational methods is one of our strengths. Along that line, he suggested a research idea that could be roughly titled "Genetics Algorithms and Programming" exploring how such algorithms could be applied to applications such as specmanship.

8. RTAR Submissions

The current list of RTARS was reviewed as a starting point for the 2003 Research Plan to be submitted this August. The latest list is:

- Prototype Demo of IFC/ifcXML Interoperability in Support of HVAC&R Activities
- Web-based Collaborative Environment for Standards Development
- Retooling the HVAC Education Process to be Able to Support the Use of Collaborative Design
- Multimedia database for examining and comparing HVAC Design Alternatives

Krishnan Gowri suggested removing the standards development RTAR as the topic does not appear likely to be accepted. The subcommittee than agreed to submit the list above without the standards-related RTAR as TC1.5's 2003 research plan.

9. Adjournment
The meeting was adjourned at 19:12.

Meeting Minutes

Internet and Emerging Applications Subcommittees

Combined Meeting – ASHRAE TC 1.5

Kansas City 2003 Annual Meeting
Sunday, June 29th, 5:00-6:30 p.m. (Hyatt, Suite 3722)

1. Welcome and introductions

- The meeting was called to order at 5:00 p.m.

2. News and updates

- Starting with the Anaheim meeting, Rob Hitchcock, the Internet sub-committee chairman, will assume the role of vice-chairman for TC 1.5. Bruce Billedeaux has agreed to serve as the new Internet sub-committee chairman. The Internet and Emerging Application sub-committee will continue to combine the sub-committee meeting and retain the same meeting time slot (Sunday from 5:00 – 6:30 p.m.).

- Bob Old gave updates of the CABA/XML web service activities.

3. Program proposals for upcoming ASHRAE meetings

- Seminar 18: Establishing Cost Effective Energy Base-Line for Measurement and Verification is scheduled on Monday, June 30th, at 8:00 a.m.

- Old program and new program were discussed. Attendees have voted on the following programs to be submitted to the Program sub-committee chairman for consideration.

Type of program	Description	Program chair
Seminar	Computer tools for sustainable design	Dwyer
Seminar	Emerging web applications for HVAC and Energy Industries	Hitchcock
Forum	Global virtual participation in ASHRAE meeting	Dwyer
Seminar	It's a small world after all – Interesting software from far away	Forrester
Forum	Are we ready to use web services for controls?	Gowri

4. Research ideas/proposals/opportunities related to subcommittee's interests

- Two new research ideas were discussed:

	Description	Idea originator
	Spider for searching and pulling information from ASHRAE – TC web site: pulling contents that are useful for other TC	Billedeaux
	Emerging web applications and technologies in HVAC industry	Gowri

5. Old business/issues/initiatives
- none

6. New business/issues/initiatives

- none

7. Adjourn

- The meeting was adjourned at 6:30 p.m.

TC 1.5: Program Subcommittee Meeting Minutes – *(2003 Summer Meeting)*
Kansas City, Missouri (06/29/03)

In Attendance: Bruce Billdoux, Charlie Culp, Tim Dwyer, Mike Galler, Jeff Haberl, Rob Hitchcock, Alison Kwok, Ron Nelson, Bob Old, Mich Schwedler, Pornsak Songakakul, Jim Watts and Krishnan Gowri (Subcommittee Chair)

Meeting Called to Order: 7:15 p.m. (06/29/03), Hyatt, Rm. 3722

1. **Feedback from Programs at Chicago.**
   i. Symposium CH-03-12: Interoperable Computer Applications
   ii. Seminar 28: Building Automation Computer Security After 9-11
   iii. Seminar 11 (co-sponsored): The e-Classroom
   iv. Seminar 43 (co-sponsored): New Issues with State-of-the-Art DDC Systems
   v. Poster Paper based on RP 1017

   All seminars were well attended and overall attendance exceeded estimates. The symposium had a relatively low turnout because of the poor scheduling (held on Wednesday towards the end of the meeting).

2. **Programs in Kansas City:**
   i. Seminar 18: Establishing Cost Effective Energy Baselines for Measurement and Verification
      - Monday 6/30 - 8:00 to 10:00 a.m. (Pornsak)
   ii. Forum 14: How Secure is Your Wireless Office Place - Tuesday 7/1 - 8:00 to 8:50 a.m. (Culp)
       (Charlie Culp has a schedule conflict and Mike Pouchak will be the moderator)

3. **Subcommitte reports** – Emerging Applications and Internet subcommittees proposed two new seminars and two new forums. The program subcommittee proposed a new forum. All of these were included in the program proposal for Anaheim (program details are listed in the attached spreadsheet).

4. **Anaheim Program Proposals** – A total of eight program proposals were considered for the Anaheim meeting. The Program Subcommittee ranked these proposals and recommends the following top five programs for submission. All program proposals and ranking information are provided in the attached spreadsheet.

i.	Seminar	Computer Tools for Sustainable Design	Dwyer
ii.	Seminar	Emerging Web Applications for HVAC and Energy Industries	Hitchcock
iii.	Forum	Global Virtual Participation in ASHRAE Meetings	Dwyer
iv.	Seminar	It's a Small World Afterall - Interesting Software from Faraway	Forrester
v.	Forum	Are We Ready to Use Web Services for Controls ?	Gowri

   Program chairs are reminded to submit all information on-line before August 8.

5. **Future Symposium Proposals** – Members are encouraged to provide ideas for new symposiums. TC 1.5 has been traditionally sponsoring at least one symposium at every ASHRAE meeting. But there are not too many future symposium proposals and we should come up with new proposals and announcements to attract authors and speakers.

Meeting adjourned at 8:20 p.m.

TC 1.5: Program Subcommittee - Proposed Programs List (Updated 06/29/2003 - Kansas City)						
Rank	Venue	Type	Title	Chair	Speakers Committed	Notes
Programs for Anaheim						
1	Anaheim	Seminar	Computer Tools for Sustainable Design	Dwyer	Yes	8 Votes
2	Anaheim	Seminar	Emerging Web Applications for HVAC and Energy Industries	Hitchcock	Yes	5 Votes
3	Anaheim	Forum	Global Virtual Participation in ASHRAE Meetings	Dwyer	Yes	4 Votes
4	Anaheim	Seminar	It's a Small World Afterall - Interesting Software from Faraway	Forrester	Yes	Dwyer - Communicating, 3 Votes
5	Anaheim	Forum	Are We Ready to Use Web Services for Controls ?	Gowri	Yes	3 Votes
6	Anaheim	Seminar	Security Issues with your Wireless Infrastructure (warchalking c/o Bob Old)	Schwedler	Yes	1 vote
7	Anaheim	Forum	AHSREAE 20/20 - Is the HVAC Engineer Endangered from the Research done in 2000-2005 ?	Schwedler	Yes	0 Votes
8	Anaheim	Forum	What does the ASHRAE Membership want from Electronic Manufacturer's Product Information	Grondzik	Yes	0 Votes
Future Programs						
	Future	Seminar	Is that a cell phone in your bowels or are you just experiencing borborigimi	Hydeman		
	Future	Symposium	1017 RP (Ankleman and Haberl 1, Kreider c/o Nelson 1) and Advanced computer applications in HVAC with Agami	Watts	No	
	Future	Forum	ASHRAE Research Developed Software: Should it be free?	Hydeman	Yes	
	Future	Seminar	Methods for exchanging / integrating data among different HVAC & Control systems and business information systems	Pornsak		
	Future	Seminar	Cool Stuff that ASHRAE Could be Doing Using the Internet	Grondzik		
	Future	Seminar	Internet based training	Grondzik		
	Future	Seminar	Network Applications of Internet, Intranet and Building Automation	Pouchak	Yes	
	Future	Forum	Collaborative Web Based Benchmarking	Norford		
	Future	Seminar	A Day in the life of ASHRAE members in 10 years from now	Culp		
	Future	Seminar	Emerging Internet Technologies Bring New Business Opportunities	Dunn		
Past Programs						
(6/03)	Kansas City	Seminar	Establishing Cost Effective Energy Baseline for Measurement and Verification	Pornsak		
(6/03)	Kansas City	Forum	How Secure is Your Wireless Office Place	Culp		
(1/03)	Chicago	Poster Paper	1017 RP	Haberl		
(1/03)	Chicago	Symposium	Interoperable Computer Applications	Branson		
(1/03)	Chicago	Seminar	Computer Security	Pouchak		
(1/03)	Chicago	Seminar	Experiences in Distance Learning: Leveraging Curriculum through Media	Pouchak		co-sponsored
(6/02)	Honolulu	Seminar	Internet Technology for HVAC/R Business: Use It or Lose It	Dwyer		
(6/02)	Honolulu	Seminar	Terms that Your Engineer Knows, but You Don't	Schwedler		
(6/02)	Honolulu	Seminar	Self-Configuring Controls: Needs, Technology and Potential Benefits	Brambley		co-sponsored
(1/02)	Atlantic City	Seminar	Uses and Benefits of Electronic Collaboration, Newsrooms and Groupware	Pouchak		
(1/02)	Atlantic City	Symposium	Tools and Techniques for Calibration of Component Models	Reddy		
(6/01)	Cincinnati	Seminar	Internet for Global Working	Dwyer		
(6/01)	Cincinnati	Seminar	Future NET Gains for the AE Office	Kammers		
(6/01)	Cincinnati	Seminar	Pattern-Recognition-Based Fault Detection and Diagnostics for Building Operation	Brambley		
(6/01)	Cincinnati	Seminar	Future NET Gains for the AE Office	Kammers		
(1/01)	Atlanta	Seminar	Interoperable Computer Applications for the Computer Industry	Hydeman		
(1/01)	Atlanta	Forum	What Does the ASHRAE Membership Need from the Computer Applications Handbook	Pouchak		
(6/00)	Minneapolis	Forum	How Should We Apply Electronic Media to the Development and Implementation of Standards?	Hydeman		
(6/00)	Minneapolis	Forum	Sensors for HVAC: Problems, Needs and Technology	Brambley		
(6/00)	Minneapolis	Seminar	What is the Future Relationship Between DDC and the Web	Branson		
(6/00)	Minneapolis	Seminar	Applications of Electronic Media for the Development and Implementation of Codes and Standards	Hydeman		