



AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS INC.

LONDON CANADA CHAPTER #116

<http://LondonCanada.AshraeChapters.org>

OCT 30/2006

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TOPIC:

SYSTEM EFFECT FACTOR **How it Effects Operating Cost**

Mr Bernard Ratledge
SAF Air Services Ltd.

The presentation will deal with

- a) what is a System Effect Factor (SEF)
- b) why does it occur
- c) how is it identified
- d) how do you overcome the effect it has on System Operating Cost
- e) how to avoid it in future installations.

Mr Ratledge will also include references to the Commissioning process and how it benefits the elimination of SEF being created.

An article on SEF by Mr Ratledge was recently published is in the February 2006 edition of the ASHRAE Journal

Meeting - Monday Oct 30/2006

THE LAMPLIGHTER INN, 591 Wellington Rd., London

London Chapter Members = \$25.00

Member's Meal Plan = \$125.00

Students = \$10.00

Others = \$35.00

CASH BAR

5:15-Social

ALL YOU CAN EAT BUFFET

6:00-Dinner

7:15-Program





President's Message

I hope those of you that were able to make it out to our last meeting enjoyed the presentation on Energy Management Information Systems presented by Mr. James Hooke. Jim's talk spoke volumes of experience in this end of the business and I'm sure that all of us were thinking at one point or another of areas in which we can imply some of these energy managing strategies.

This month's speaker is Mr. Bernard Ratledge authored an article in the Feb. 2006 edition of the ASHRAE Journal titled "System Effect Factor - How it Affects Operating Costs". This was a well written article by a local ASHRAE member and I hope that you will be able to join us in hearing more about the subject.

The Board of Governors has been discussing the idea of holding a small trade show as our meeting in late March and we are interested in getting feedback from the chapter members to see if it is something we should proceed further with. In addition to the trade show portion we feel it would be a great opportunity to hold our second student night and advertise it to the students as a job-fair night. It would also be intended to draw new faces from the industry to our local event and pose as our second membership promotion night. Given the amount of work and preparation that would have to go into this type of event, we need to act quickly if we are to proceed, so a prompt reply on the subject would be greatly appreciated. This will be one of the business session items at the Oct. meeting, if you wish to hold your comments or suggestions until that time, that is fine or you can email me directly in the mean time scott@somersep.com

Scott Turner – President
scott@somersep.com
London Canada Chapter President 2006-2007

Student Night Sponsors

Another student night has come and gone with great success. 10-students, many first time attendees, volunteered their Monday evening to come and hear what ASHRAE had to offer.

A special thanks to the following companies who sponsored a student's meal for the UWO and Fanshawe student night:

Somers Environmental Products Inc.
E.H. Price
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Be on the lookout for some more students sitting at a table near you!

Jack Maynard
Student Activities Chair, London Canada Chapter



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October Speaker Bio

Mr Bernard Ratledge SAF Air Services Ltd.

Mr Ratledge has been engaged in the design, installation, TAB and commissioning of HVAC systems for the past 40 years. The last 9 years have been spent with the Dufferin Peel Catholic District School Board responsible for daily operation and maintenance of Building systems in 141 schools, 80% of which are DDC controlled and controlled remotely from the Board's Plant Department. Bernard was a voting member of ASHRAE GPC 1 and GPC-4 having served on both Committees for 3 years. As well as being a Member of ASHRAE and Associate Member of The Chartered Institution of Building Services Engineers (UK)

An article he wrote & recently published is in the February 2006 edition of the ASHRAE Journal.

September Meeting Summary

JAMES H. HOOKE an Energy Management Consultant from Ottawa spoke about Energy Management Information Systems (EMIS). He explained that just collecting data and equipment information is not enough as the processes and history of the facility should also be looked at. A EMIS Handbook was available at the meeting.

Hamilton Meeting

The Hamilton ASHRAE Chapter is hosting Distinguished Lecturer - Carl N. Lawson, PWI Commissioning Services, Durham, NC on Nov 7, 2006. Mr Lawson will be speaking on The Operation & Maintenance of HVAC Systems for Improved Comfort and Air Quality

See the notice attached to this newsletter for more information of visit with Hamilton ASHRAE Chapter at

November Meeting

The next ASHRAE London Meeting on Monday Nov 27/2006 will feature speaker Mr. Julian Rimmer, EH Price Ltd. who will do a presentation on "Air Distribution Options in Green Buildings"



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**ASHRAE LEARN ON-LINE**

This fall, The ASHRAE Learning Institute will be presenting six seminars on topics including Introduction to Green Buildings and Sustainable Construction, Leadership Skills for Engineering Leaders-Situational Leadership®, Complying with Requirements of ASHRAE Standard 62.1-2004 and more. Visit www.ashrae.org/onlinepds

ASHRAE Joins PERSI to Promote Infrastructure Sustainability

ATLANTA – The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) has joined an alliance to help promote sustainable infrastructure such as buildings, water resources, transportation, energy generation and waste treatment.

The alliance, Practice, Education and Research for Sustainable Infrastructure (PERSI), is an initiative of the American Society of Civil Engineers (ASCE) that works to promote and translate sustainable practices into action within its member organizations.

ASHRAE is the first organization to formally join PERSI by signing the memorandum of understanding. By joining the alliance, which will not itself produce standards or guidelines, ASHRAE will work with other PERSI member organizations to assist with educational programs, conduct research, and contribute knowledge about sustainable infrastructure, among other activities.

ASHRAE President Terry Townsend noted that joining PERSI helps further ASHRAE's mission of sustainability.

"By partnering with other organizations worldwide, ASHRAE can enhance its own current efforts and supplement the activities and resources of other groups," he said. "This sharing of ideas and resources can only help us reach our energy and sustainability goals faster and more efficiently."

"Sustainable infrastructure is vital to a sustainable human society," Richard N. Wright, Ph.D., an honorary member of ASCE who is spearheading the effort to establish PERSI, said. "ASHRAE has illustrated its leadership in the infrastructure community by contributing strongly to the development of the PERSI initiative. PERSI now will begin its important efforts to advance and incorporate concepts and knowledge of sustainability into the standards and practices used throughout the life cycle of infrastructure systems."

ASHRAE also will assist PERSI in developing a common language for the definition and achievement of sustainable infrastructure. The alliance currently defines sustainability as the challenge of meeting human needs for natural resources, industrial products, energy, food, transportation, shelter and waste management while conserving and protecting external and internal environmental quality and the natural, economic and social resources essential for human needs.

The alliance has attracted more than 15 groups that have participated in its development, including the American Institute of Architects, the American Planning Association, the American Water Works Association, and the National Institute of Standards and Technology.

ASHRAE Hires Staff in Support of Strategic Plan

ATLANTA – In support of its strategic plan adopted earlier this year, ASHRAE has hired staff to oversee its marketing, certification and advocacy efforts. The plan will help ASHRAE focus its efforts to ensure that its products and services are timely, relevant and appropriately positioned to serve the changing marketplace. The plan can be found at www.ashrae.org/strategicplan.

To support the strategic plan goal of making ASHRAE a premier provider of HVAC&R expertise, Jeff Dimond has been named marketing director of ASHRAE. Dimond has some 24 years of communications management experience. At ASHRAE, he will oversee implementation of activities that will enable the Society to make the greatest amount of its products and services available to the largest number of consumers. Before joining ASHRAE, Dimond served as director of marketing and communications for Conway Data Inc., Norcross, Ga., where he developed marketing and public relations activities for non-profit and business association clients of the association management firm.

A resident of Roswell, Ga., Dimond has a master's of business administration degree in athletic administration/marketing from the University of Arizona and a bachelor's of arts degree in political science/journalism from the University of Alabama. ASHRAE also has hired Joyce Abrams as manager of certification. She will develop and implement a credentialing program for HVAC&R engineers to help promote ASHRAE as a leader in industry education and professional development. Before joining ASHRAE, she was an assistant vice president in the education and training division of LOMA where she oversaw the design and development of credentialing programs, courses and course materials and managed the development and/or production of up to 35 college-level textbooks or online courses a year. A resident of Atlanta, Abrams has a master's of science degree in mass communications from Indiana University, and a juris doctorate and a bachelor's of arts degree in journalism from the University of Georgia.

The Society also has hired Doug Read as program director of government affairs. He will oversee management of the Society's governmental affairs efforts, including government outreach and issues management. Read served as manager of government relations, compliance and regulatory affairs for the National Electric Manufacturers Association (NEMA), where he developed strategies for interface with government bodies to ensure support of electrical industry safety, environmental and trade policy. A resident of Washington, D.C., Read has a master's of science degree in human resource and organization development from the University of Maryland and a bachelor's of science degree in industrial engineering from State University of New York.



ASHRAE, founded in 1894, is an international organization of 55,000 persons. Its sole objective is to advance through research, standards writing, publishing and continuing education the arts and sciences of heating, ventilation, air conditioning and refrigeration to serve the evolving needs of the public.

**ASHRAE Joins Former President Clinton in Climate Initiative**

ATLANTA – The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) will join with former President Bill Clinton in an initiative to reduce carbon emissions and increase efficiency in the world's largest cities.

The Clinton Climate Initiative (CCI) is a Clinton Foundation program dedicated to making a difference in the fight against climate change in practical and measurable ways.

The initiative was launched Tuesday at a news conference in Los Angeles, where Clinton was joined by London Mayor Ken Livingstone, Los Angeles Mayor Antonio Villaraigosa and San Francisco Mayor Gavin Newsom. British Prime Minister Tony Blair also attended to show support for the initiative. ASHRAE President Terry Townsend, P.E., also was present.

"ASHRAE has a long history of engineering for sustainability by applying its diverse technology to reduce the consumption of energy in the built environment," Townsend said.

"We are pleased to partner with the Clinton Foundation and others to accelerate the adoption of energy-saving technologies by city planners."

For more than 30 years, ASHRAE energy standards have set the standard of care for the efficient use of energy resources in buildings. In particular, since being developed in response to the energy crisis in the 1970s, ASHRAE's Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings, has influenced building designs worldwide. It has become the basis for building codes and a standard for building design and construction recognized throughout the world.

"Recognizing the impact of buildings on global energy use and greenhouse gas emissions, ASHRAE will work with city planners to support development of codes, standards, energy use metrics, and other programs that lower environmental impacts," according to an agreement signed by ASHRAE and the Foundation. "ASHRAE's assistance will facilitate the transfer of existing tools and technology, and support solutions to common energy and greenhouse gas emission challenges facing large city group leaders."

Urban areas are responsible for more than 75 percent of all greenhouse gas emissions in the world. Therefore, reducing energy use and greenhouse gas emissions in cities is fundamental to any effort to slow the pace of global warming.

"It no longer makes sense for us to debate whether or not the earth is warming at an alarming rate, and it doesn't make sense for us to sit back and wait for others to act," said President Clinton at the announcement event. "The fate of the planet that our children and grandchildren will inherit is in our hands, and it is our responsibility to do something about this crisis. The partnership between my Foundation and the Large Cities Climate Leadership Group will take practical and, most importantly, measurable steps toward helping to slow down global warming, and by taking this approach I think we can make a big difference."

The Clinton Climate Initiative will assist the large cities in the group in reducing greenhouse gas emissions and increasing energy efficiency. To enable partner cities to do so, CCI will:

- Create a purchasing consortium that will pool the purchasing power of the cities to lower the prices of energy-saving products and accelerate the development and deployment of new energy-saving and greenhouse-gas-reducing technologies and products.
- Mobilize the best experts in the world, including ASHRAE, to provide technical assistance to cities to develop and implement plans that will result in greater energy efficiency and lower greenhouse gas emissions.
- Create and deploy common measurement tools and internet-based communications systems that will allow cities to establish a baseline on their greenhouse gas emissions, measure the effectiveness of the program in reducing these emissions and to share what works and does not work with each other.

There are a number of practical steps cities can take to increase efficiency and reduce emissions, including:

- Building codes and practices that make use of more effective insulation and more energy efficient windows, heating and ventilation systems, and lighting
- Localized, cleaner electric generation systems
- More intelligent design of electric grids both across the city and within office and municipal buildings

The CCI-Large Cities partnership is initially targeting 22 of the largest cities in the world - Berlin, Buenos Aires, Cairo, Caracas, Chicago, Delhi, Dhaka, Istanbul, Johannesburg, London, Los Angeles, Madrid, Melbourne, Mexico City, New York, Paris, Philadelphia, Rome, Sao Paulo, Seoul, Toronto, and Warsaw.

Many of these cities will be visited by ASHRAE leaders as part of initiative later this calendar year. The partnership anticipates that many more cities will join over the next four to six months.

Other partners in the Clinton Climate Initiative include the U.S. Green Building Council, the Alliance to Save Energy, and the International Council for Local Environmental Initiatives. ASHRAE is also partnering with the U.S. Green Building Council and the Illuminating Engineering Society of North America to develop the standard 189P, Design of High-Performance Green Buildings Except Low-Rise Residential Buildings.



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**ASHRAE Awards Scholarship in Memory of Frank Coda**

ATLANTA – A scholarship created in memory of Frank Coda, ASHRAE's former executive vice president who died in 2004, has been awarded for the first time. The undergraduate engineering scholarship was awarded to Jeremy Dreiling, an architectural engineering student at Kansas State University. It provides \$5,000 for one year. "Frank saw the need for ASHRAE's involvement with education and always advocated assistance for students and supported cooperation between ASHRAE and universities," Jeffrey Spitler, Ph.D., P.E., chair of ASHRAE's Scholarship Trustees, said. "This scholarship is a very appropriate way to recognize his contributions and honor his memory. The endowed scholarship will provide significant help to a deserving student each year." Coda became ASHRAE executive director in 1981, was named chief staff officer in 1984, and became executive vice president emeritus in January 2004. He continued to work for ASHRAE in a consulting capacity until his death in June 2004. ASHRAE's scholarship program was launched in 1989 under Coda's leadership. Since that time, ASHRAE has awarded 136 scholarships. The ASHRAE Scholarship program encourages and assists HVAC&R education through scholarships and fellowships.

Other scholarships awarded by ASHRAE this year, totaling some \$60,000, are:

- Reuben Trane Scholarships, \$10,000 for two years, Adrian Akerson, space physics and aeronautics, Embry-Riddle Aeronautical University, Daytona Beach, Fla.; Kevin Moore, mechanical engineering, Saginaw Valley State University, University Center, Mich.; and Peter McKeon, mechanical engineering, University of Pittsburgh;
- ASHRAE Region VIII Scholarship, \$3,000 for one year, Brad Crumpton, mechanical engineering, University of Texas at Tyler;
- ASHRAE Memorial Scholarship, \$3,000, Blake Erb, mechanical engineering, University of Saskatchewan;
- Associate Engineering Technology, \$3,000, David Fox, commercial/industrial refrigeration and HVAC technology, Bellingham (Wash.) Technical College; and David Pirozzoli, HVAC technology, Harrisburg (Pa.) Area Community College;
- General Scholarship, \$3,000, Kai Hartman, mechanical engineering, Tri-State University, Angola, Ind.; and Nashley Mascarenhas, mechanical engineering, Purdue University;
- Henry Adams Scholarship, \$3,000, Kevin Kaufman, architectural engineering, Pennsylvania State University;
- Bachelor Engineering Technology, \$3,000, Andrew Mengwasser, mechanical engineering technology, Southern Polytechnic State University, Marietta, Ga.;
- Alwin B. Newton Scholarship, \$3,000, Martin Nolan, mechanical engineering, City College – City University of New York;
- J. Richard Mehalick Scholarship, \$3,000, Igor Tatarintsev, mechanical engineering, University of Pittsburgh;
- Duane Hanson Scholarship, \$3,000, Cassie Waddell, architectural engineering/architecture, University of Kansas.

Changes Related to ETS and Ventilation Proposed for ASHRAE 62.1

ATLANTA – Ventilation for smoking areas returns to center stage through a proposed addendum to ASHRAE's Standard 62.1.

Proposed addendum i will be open for public comment until Nov. 6. To read the proposed addendum and comment, visit www.ashrae.org/publicreviews. ANSI/ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality, specifies minimum ventilation rates and indoor air quality requirements for commercial and institutional buildings.

The proposed addendum removes the existing requirement for an increase to the ventilation rates prescribed in Table 6-1 (and/or an increase in air cleaning) for smoking areas. It also strikes informative language explaining why specific rates for smoking areas cannot be prescribed, adds a reference to Section 5.18 smoking-related separation requirements, and strikes a requirement in Table 6-1, Note 2, to determine smoking-permitted area rates using means other than the table.

"The proposed changes, based in part on recent position statements issued by World Health Organization and the U.S. Surgeon General, reflect the opinion of cognizant authorities that no safe level of environmental tobacco smoke exists," Dennis Stanke, chair of the 62.1 committee, said. "Whether the proposed changes also reflect the opinions of Standard 62.1 stakeholders will be determined during the public review process. The eventual content of the standard depends on the valuable participation of all interested parties."

ASHRAE Looks to Develop Water Conservation Standard

ASHRAE – Requirements regarding the amount of water used to operate HVAC, plumbing and irrigation systems would be established under a proposed standard from the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). "Water is the most important renewable resource on this planet," Terry Townsend, P.E., ASHRAE president, said. "To protect this source of life, we must reduce the demand and consumption that the built environment is placing on available water sources. It is our intention to develop a standard that can be used globally to conserve this valuable resource." The proposed standard, Conservation of Water Use in Building, Site and Mechanical Systems, would provide baseline requirements for the design of buildings, landscapes, and mechanical systems that minimize the volume of water required to operate HVAC systems, plumbing systems, and irrigation systems. The standard would address water use efficiency through water conservation measures implemented during design and construction of residential, commercial, institutional and industrial projects. It would not apply to storm water management. The proposed title, purpose and scope of the standard are open for public comment until Nov. 20. Also, members are being sought to serve on a committee to write the standard. To join the committee or comment on the draft title, purpose and scope, visit the standards actions for Oct. 6 at www.ashrae.org/publicreviews.



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**ASHRAE Student Design Competition****Winning Projects Focus On Mixed-Use Buildings**

ATLANTA – Night pre-cooling, naturally daylight areas and low-emission HVAC systems are some of the sustainable measures selected by students as part of ASHRAE's 2006 Student Design Competition. This year's competition focused on the mixed-use renovation of the Dallas Power & Light building in a historic area of Dallas. The renovation includes converting the majority of the former office building into residential apartments, with retail space occupying the first floor of the building. Awards were announced in three categories: HVAC system selection, HVAC system design and architectural design.

The winning entries in the HVAC system selection and HVAC system design categories are awarded to the same team from The Pennsylvania State University: Justin Bem, Kevin Kaufman, David Melfi, Jon Gridley, Jessica Lucas and Yulien Wong. Their faculty advisor is William P. Bahnfleth, Ph.D., P.E.

For the HVAC system selection category, the students selected water source heat pumps, giving the system a life cycle cost of \$7,464,000. The system selected calls for water-source heat pumps to parallel the one rooftop unit serving floors two through 20 and an additional rooftop unit for the first-level retail area. This system allows for easily converting first-level retail space to a new function, limits maintenance disruption to individual apartments and the roof, and allows for separate metering of retail space. The ventilation systems were evaluated using Standard 62.1 and on their ability to fit into available mechanical room and shaft space. The option chosen was a rooftop unit paralleled by WSHP for residential units, and a rooftop unit serving the retail areas. The students said, "The separation of the two types of spaces allows for better flexibility in the system and allows for future growth." The system also allowed for lower cost and emissions as well while allowing the building meet Standard 90.1 without compromising historic integrity of building.

For the HVAC system design category, the students designed a decoupled outdoor air system with a parallel sensible system with an energy cost of \$4.72/square foot per year. Because the mechanical penthouse on the second-floor roof of the annex was so close to the ground, dealing with architectural, environmental and acoustical impacts were serious considerations. Some of the solutions the students used were: night time pre-cooling with unconditioned night air, and using only fan energy for the retail spaces to reduce cooling load during the day. The students also used a dedicated outdoor air system.

First place in the architectural design category is awarded to Alissa Ogen and Sonia Carias of Savannah College of Art and Design. Their faculty advisor is Emad M. Afifi, Ph.D.. The students, who were required to design a mixed-use collegiate space, designed a student activities center complete with student dormitories, a theater, recycling centers, an amphitheater, retail, landscaping and dining space. The entry's sustainable design features included pervious sidewalk materials, photovoltaic glass panels inside the cafeteria, translucent, diffuse light-transmitting walls and reflective roofing materials. The students' design also includes a naturally ventilated atrium near the lobby and a naturally daylight cafeteria that is also shaded to save on energy costs.

Awards will be presented at ASHRAE's 2007 Winter Meeting Jan. 27-31 in Dallas. Winning student groups will each have a poster presentation to display their projects at the meeting. The competition recognizes outstanding student design projects, encourages undergraduate students to become involved in the profession, promotes teamwork and allows students to apply their knowledge of practical design.

ASHRAE Research Provides Comparison Data for Unitary Equipment

ATLANTA – New research from ASHRAE will lead to better understanding of humidity control and energy cost when comparing unitary equipment.

ASHRAE Research Project-1254, Evaluating the Ability of Unitary Equipment to Maintain Adequate Space Humidity Levels, Phase II was funded in part by the Air-Conditioning and Refrigeration Technology Institute.

"The results will help designers better understand the humidity control and energy cost impacts of the unitary equipment options compared in this project," said lead researcher Michael J. Witte, Ph.D., GARD Analytics. "Many of these options are in limited use so actual performance experience is not available for a broad range of building types or climates. What performs well on a restaurant in Orlando may not be effective on a retail store in Atlanta. This comparison of 18 system types across seven building types in 10 climates provides additional equipment selection information."

The project provides designers with:

- Comprehensive analysis of humidity control performance of a wide range of DX system configurations, including sub-cool reheat, wrap-around heat pipes, dual-path systems, enthalpy heat recovery and desiccant dehumidifiers.
- Significant advancement in whole building energy simulation capabilities for modeling DX equipment by adding new capabilities to EnergyPlus. This provides designers and analysts with access to study specific applications and extend the results of this analysis, according to Witte.
- Identification of key issues for further exploration to better understand some of the key drivers and possibly develop some simple new system configurations that can efficiently control humidity.

The final report can be purchased from "research results" at www.ashrae.org/research. The cost is \$30 (\$24 ASHRAE members).





ASHRAE HAMILTON

Distinguished Lecturer Program – November 2006

Operation & Maintenance of HVAC Systems for Improved Comfort and Air Quality to be Addressed by Distinguished Lecturer

EVENT: Operation & Maintenance of HVAC Systems for Improved Comfort and Air Quality a presentation sponsored by the Hamilton Chapter of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

DATE: November 7th, 2006 @ 5:00 pm

LOCATION: Hamilton Yacht Club, Foot of McNab St., Hamilton, ON

ISSUE: The heating, ventilating, air-conditioning and refrigerating industry affects the public's quality of life in many ways, from indoor air quality, to conserving energy in buildings, to the development of refrigerants that do not harm the environment. As part of its outreach to the community, the Hamilton Chapter is sponsoring a presentation on Operation & Maintenance of HVAC Systems for Improved Comfort and Air Quality featuring an internationally recognized expert in the HVAC&R field.

Indoor air quality is of increasing concern as society redefines the needs of the indoor environment. This talk presents a new perspective on the topic, starting with the proper preventative program and how to reduce the opportunity of bad indoor air quality relating from a proper maintenance program. We will look at the location of outside air intakes, air- handling systems, cooling towers and other areas.

SPEAKER: Carl N. Lawson, PWI Commissioning Services, Durham, NC

COST: ASHRAE Hamilton Chapter Member - **\$30.00**
Non-member - **\$40.00** Students - **\$15.00** **Note:** Taxes included.

CONTACT: Nathan Martin, O'Dell Associates, Burlington, ON
e-mail: nathan@odellassoc.com

Payment may be made in CASH or CHEQUE at time of meeting. If paying in advance, please make cheque payable to "ASHRAE Hamilton Chapter"

Please return form to Wilf Laman no later than October 27th, 2006.

Note: **Attendance is limited to 50 people. Reserve your spot early on a first come first served basis.**

ASHRAE London Chapter - 2006/07 Meeting Program

Date	Speaker	Topic	Promotion Night
Sept 25/2006	Mr. James (Jim) Hooke, James Hooke & Assoc. Ltd.	"Energy Management Information Systems (EMIS)"	Student
Oct 30/2006	Mr. Bernard Ratledge, SEF Air Services Ltd.	"Systems Effect Factor - How it Effects Operating Cost"	
Nov 27/2006	Mr. Julian Rimmer, EH Price Ltd.	"Air Distribution Options in Green Buildings"	Membership, Research
Jan 29/2007	Prof. John Wright, P.Eng., University of Waterloo	"Improving Load Calculations for Fenestration with Shading Devices"	
Feb 26/2007		Technical Tour	
Mar 26/2007		HVACR Trade Show	Student, Membership
April 30/2007		Distinguished Lecturer	Research
June __/2007		Golf Tournament	