

BUFFALO TALES

Newsletter of the Manitoba Chapter

The Manitoba Chapter of the American Society of Heating, Refrigerating and Air Conditioning Engineers was chartered in September 1935. It is the second oldest ASHRAE Chapter in Canada. ASHRAE Manitoba is part of ASHRAE Region XI and covers ASHRAE members in Manitoba and Northwest Ontario.



ASHRAE Supper Meeting

Thursday March 12, 2009

Refrigeration Night

Victoria Inn, 1808 Wellington Avenue

Will Stoecker ASHRAE Distinguished Lecturer Industrial Refrigeration

5 PM Social, 6PM Supper

Will Stoecker, ASHRAE Distinguished Lecturer will provide an overview of the field, describing a number of applications of industrial refrigeration. Many industrial refrigeration systems are quite similar to those providing cooling in air-conditioning plants, but because many industrial systems operate at low temperatures other sets of conditions arise. Low temperatures require special provisions in the building as well as usually requiring the use of multi-stage compression. Reciprocating and screw compressors are most widely used, and special handling of the lubricating oil is required.



Will Stoecker is Professor Emeritus of the Mechanical Engineering Department of the University of Illinois in Urbana where he taught and conducted research for 42 years. He concentrated on work in thermal system design, air conditioning, and refrigeration. In the last 12 years of his work at the University he concentrated on industrial refrigeration. He is a Fellow of both ASHRAE and ASME, and has received the E. K. Campbell Award and the F. Paul Anderson Medal, ASHRAE's highest technical award.

In addition to teaching classes and advising graduate students on research projects, Dr. Stoecker worked summers at the Trane Company, Carrier Corporation, E. I. DuPont and Exxon Research. He has consulted for many firms in the industry. He was on the Scientific Advisory Council of the International Association of Refrigerated Warehouses and the Scientific Advisor of the International Institute of Ammonia Refrigeration for ten years. He is the Associate Director of the Industrial Refrigeration Workshop, a one-week program conducted annually for technical staff in the refrigeration industry.

President's Message

Sergio Almeida, P. Eng.

March is here and despite the seemingly never ending cold, spring is almost upon us. That means two things; 1) hockey playoff time, and 2) the sudden realization of many building owners that they need to repair/ maintain/ replace their cooling systems.

Playoff time is an exciting ritual for many players, parents, and fans. Minor hockey teams have a rush of excitement as they chase that “dream” of winning a championship, knowing that no matter what life throws at them no one can ever take away that Peewee A2 City Championship. NHL Fans similarly watch with great intent and hope that their team will achieve hockey immortality by hoisting Lord Stanley's silver cup.



In our industry on the other hand, we shake our heads at the annual ritual, wondering why the job couldn't have been done in the fall when there was plenty of time to get it done. But of course we all get sucked into the mess and get it done anyway, knowing that as soon as the Victoria Day weekend hits people will be screaming for cooling.

So while you're staying late at the office, or heading home knowing that after dinner you'll be right back at work, remember that ASHRAE is still here. Hopefully everyone can still squeeze in a couple hours to attend the dinner meeting to let your brain unwind. I know I will.

Cheers,
Sergio

Coming Events

April 7 & 8, 2009 – Better Buildings Conference, Winnipeg Convention Center - “Our Sustainable Future” For details, go to www.betterbuildingsconference.com

April 16, 2009 - ASHRAE Manitoba Seminar on Chilled Beams - 1:00 to 4:00 PM
Dr. Stan Mumma, ASHRAE Distinguished Lecturer Mumma will present a seminar on Chilled Beams at the E.H. Price Training Room, 638 Raleigh St. Registration details to follow.

ASHRAE Manitoba Dinner Meeting at the Victoria Inn
For the dinner program, Dr. Mumma will talk about **Dedicated Outdoor Air Systems (DOAS)**.

April 22, 2009 – ASHRAE/US EPA Satellite Broadcast “Clean, Lean, and Green - IAQ for Sustainable Buildings”. The program will highlight the “*Indoor Air Quality Design Guide: Best Practices for Design, Construction, and Commissioning*” currently being developed through the collaboration of ASHRAE, AIA, BOMA, EPA, SMACNA and the USGBC. Online registration for site coordinators and webcast viewers begins **March 2nd** at

www.ashrae.org/iaqbroadcast. Registration for satellite viewers begins **March 16th**. Information about the program and speakers is available at www.ashrae.org/iaqbroadcast. Three (3) PDH credits may be granted to those who view the program and then complete the Participant Reaction Form online by April 30, 2009.

May 6-9, 2009 – CRC (ASHRAE Chapters Regional Conference) in Spokane, Washington. For events schedule, registration and accommodation details go to <http://www.ie-ashrae.org/2009CRC>

Water Conservation at the 20008 Annual Meeting in Salt Lake City – Bert Phillips **Forum 14 Water Reuse**

Forums are sessions where a moderator tries to get people to share their ideas and experiences or to identify areas of interest. Whereas one can write about the ideas that were presented, the rules are that attendees cannot say who said what.

Concepts discussed included using:

- storm water for non potable uses including lawn sprinkling,
- utility and grey water or rainwater for toilet flushing
- chilled water blow down for with lawn sprinkling and landscaping (good fit because greatest availability is hot weather when need is greatest).
- rainwater for cooling towers
- trap priming

In some jurisdictions, some filtration and/or other treatment prior to re-using water. Some require dye in reuse water so that it is visibly identifiable. This is to protect people like me that may drink water from lawn sprinklers, especially if I have been outdoors on a long hot day.

When using non potable water supplies for landscaping purposes, there is a need to work with landscape people to make sure plants can tolerate water and whatever is in the water or alternatively to choose plants that can tolerate it.

The State of Virginia has developed a rainwater harvesting manual. Joel Primeau (our February 12 super meeting speaker) mentioned it in his presentation. You can see it online at <http://www.harvesth2o.com/www/www/Virginia%20Rainwater%20Harvesting%20Manual.pdf>

Seminar 48 Balancing Energy and Water Conservation

Mark Hydeman noted that– in the simulation world, economizers always work perfectly.

Mark Modera spoke about minimizing water use in non compressor cooling, including direct evaporative cooling, indirect/direct evaporative cooling and night sky radiation cooling. Scale formation reduces evaporative cooling effectiveness.

Ideally, you get 0.73 Ton hours of cooling per US gal of water or conversely 1.37 gallons of water provides one Ton hour of cooling, but in the real world, evaporative cooling is perhaps 40% of this optimum. Water used for maintenance (flushing etc.) is about half of total water used. Hydro dams cause big evaporation, up to 160 gallons per kWh generated, depending on surface to volume of the reservoir. Water loss is less in high head and run of the river operations. With climate change, this is a topic of increasing interest and concern to water and electric utilities.

Michael Sherber said power production is the largest user of fresh water in the US. Thermal plants use 2.3 gallons per kWh of electricity generated. Hydro ranges from 18 to 36 gallons per kWh. When you consider water use related to power generation, evaporatively cooled buildings use less water than mechanically cooled buildings, and electrically heated buildings use a lot of water.

ASHRAE 2008 BACnet Published

Guidance to reduce a building's energy consumption on demand is contained in the newly published BACnet standard ANSI/ASHRAE Standard 135-2008, "BACnet® - A Data Communication Protocol for Building Automation and Control Networks". Standard 135-2008 is the only open, consensus-developed standard in the building controls industry. Its intent is to ensure that compliant building equipment and systems manufactured by different companies will work together.

The 2008 version replaces the 2004 version as the standard for BACnet technical and specification efforts. It contains new guidance related to the Load Control object, an extension to reduce a building's energy consumption on demand - a key element of the integration of energy utilities and buildings to reduce or eliminate brownouts and blackouts from energy grid overload. It also covers:

- the Access Door object, the first of the extensions to fully support physical access control improvements in requirements on BACnet devices
- new capabilities such as BACnet Web Services which, among other things, are being considered for energy utility-building communications
- a standardized and interoperable means to record alarms

The cost of ANSI/ASHRAE Standard 135-2008, "BACnet® - A Data Communication Protocol for Building Automation and Control Networks" is US\$119 (\$99 ASHRAE members). To order, call ASHRAE Customer Service at 1-800-527-4723 or visit at www.ashrae.org/bookstore.

CO₂ Sensors and Demand-Controlled Ventilation - Dieter Bartel

Seminar 22 at the ASHRAE Winter Meeting in Chicago was titled CO₂ Sensors and Demand-Controlled Ventilation. The speakers provided some sobering information about the reliability of the CO₂ sensors we commonly spec to control ventilation for energy efficiency in the buildings we design.

1. Som Shrestha (Student Member) did lab tests on a representative number of commercially available CO₂ sensors of the type used in demand control ventilation (DCV) systems. CO₂ sensor readings deviate from actual levels for a variety of reasons. Some units have quite a bit of hysteresis (or drift/lag of accuracy). The sensors are more sensitive to temperature than manufactures claim. Some are so sensitive to RH levels that the researcher said they could be thought of as RH sensors with sensitivity to CO₂. All are sensitive to barometric pressure because the infra red (IR) technology used sees the number of CO₂ molecules in its sight. At higher elevations (or lower barometric pressures) fewer CO₂ molecules is interpreted as lower CO₂ levels. The sensors recalibrate themselves to typical low ambient CO₂ levels they encounter, based on an assumption that background levels are some predefined level. If low ambient levels are normally high (say 500 ppm), this would be assumed to be normal (manufacturer normally assume background is 400 ppm). If the unit is to ventilate to maintain 1000 ppm (2.5 times assumed ambient) it may actually control to 1200 to 1300 ppm, thus under ventilating the space relative to design objectives. If you are in a pristine area (normal ambient CO₂ levels of 350 ppm and in times when barometric readings rise significantly, the CO₂ sensors will over predict actual CO₂ levels and thus will over ventilate the space.

2. Bill Fisk (presented by Steve Taylor) did a field study of “as found” CO₂ sensor calibration. In general sensors had a bias toward over predicting CO₂ levels, typically by 50 to 100 ppm. CO₂ sensors need to be periodically re-calibrated. Without routine maintenance, they cannot be expected to maintain ventilation rates within 20% of the design objective, after as little in-service time as a year.

3. Steve Taylor discussed control strategies and whether or not the accuracy of CO₂ sensors was a concern for DCV systems. He stressed the importance of keeping a close eye on CO₂ sensors. To accept these sensors as being accurate is, in my words, to succumb to “blind faith”. CO₂ sensors require much more maintenance than most in the industry are believe. Steve’s experience leads him to believe that CO₂ sensor readings (and repeatability over time) cannot be trusted without a diligent maintenance and calibration program. His experience with CO₂ DCV corroborates Bill Fisk’s findings. In short, designers be warned..... DCV systems require routine monitoring and calibration.

In general, the message was that all CO₂ sensors tested (lab and in situ) will read either low or high CO₂ concentrations if:

- left un-calibrated over time or left to self calibration
- they are used where air temperatures, barometric pressures and relative humidity levels deviate from “standard test conditions”

Furthermore, they will deviate outside of manufacturers listed tolerances linearly with the deviation in temperatures, pressures and RH levels.

Last thought from seminar: As they drifted out of calibration, most sensors erred to predicting higher than actual CO₂ concentrations through the full spectrum of deviations of air conditions from test conditions, and would therefore tend to over-ventilate, and hence use more energy to condition ventilation air than is needed to maintain acceptable indoor air quality.

The Economic Slowdown and Other Random Comments from Chicago

At the 2009 Winter Meeting in Chicago, many of my ASHRAE colleagues were saying that the crash in the economy has significantly impacted their retirement plans, both the planned date and their expected level of financial security. One said “This has been even worse than divorce. I lost half of my wealth and I am still married.”

Many “green buildings” don’t go beyond “green design”. They get the plaque for green design and market that, but because performance does not match design or because it requires additional effort to get operating data to prove the buildings perform as designed, the owners or designers do not complete the task. Those interested in this topic should “Documenting Performance, Does it need to be so hard?” http://www.nxtbook.com/nxtbooks/ashrae/hpb_2009winter/ (Adam Hinge, High Performance Buildings, winter 2009).

Power plants costs five times as much as energy conservation.

Expect greenhouse gases to get unprecedented attention and funding under Obama.

HCFC22 supplies are going to get tight in the near future

ASHRAE Research – David Stones, Chapter RP Chair

Individuals and organizations are encouraged to contribute to Research Promotion for ASHRAE Research Canada. Canadian contributions support research in Canada. Canvassing is ongoing and we will be approaching more Chapter members and organizations to support this work. We have currently reached ???% of our chapter's goal for the current year. For information on how to contribute, contact me at dstones@shaw.ca or dstones@waa.ca Below is a listing of contributors.

Major Contributors

Manitoba ASHRAE Chapter		\$1,000	
Nova 3 Engineering	\$500	Airdronics Incorporated	\$250
John Brighty	\$200	Bert Phillips	\$200

Honour Roll and Other Contributors

(Honour Roll - at least \$100 personal
or \$150 corporate)

Sergio Almeida
Dieter Bartel
Robert Bisson

Daryl Friesen
Russell Lavitt
George Marchildon
Corey Nation

Jesse Sandhu
David Stones
Stirling Walkes

ASHRAE Manitoba Chapter Officers

President	Sergio Almeida	Trane	632-1543	salmeida@trane.com
President-Elect	Daryl Friesen	Midwest Engineering	989-3636	daryl@midwesteng.com
Vice-President	Jesse Sandhu	SMS Engineering	775-0291	jsandhu@smseng.com
Secretary	Stirling Walkes	SMS Engineering	775-0291	swalkes@smseng.com
Treasurer	Corey Nation	E.H. Price Ltd.	982-2222	coreyn@price-hvac.com
Governor	Dieter Bartel	Manitoba Hydro	477-7717	dbartel@hydro.mb.ca
Governor	Robert Bisson	Public School Finance Board	945-8452	rbisson@gov.mb.ca
Governor	George Marchildon	PSFB	945-0207	gmarchildo@gov.mb.ca

Committee Chairs

Chapter History	Robert McDowall		284-6678	robertmcdowall@mts.net
CTT	Russell Lavitt	SMS Engineering	775-0291	rlavitt@smseng.com
Honours & Awards	Dieter Bartel	Manitoba Hydro	477-7717	dbartel@hydro.mb.ca
Membership	Jesse Sandhu	SMS Engineering	775-0291	jsandhu@smseng.com
Programs	Johann Baetsen	E.H. Price Ltd.	661-7829	johannb@price-hvac.com
Refrigeration	OPEN			
Research & Promo	David Stones	Wardrop Engineering	272-1331	dstones@shaw.ca
Student Activities	Peter Gryc	SMS Engineering	775-0291	pgryc@smseng.com

Other

Accommodations	Jesse Sandhu	SMS Engineering	775-0291	jsandhu@smseng.com
Homepage Editor	Devin Evenson	Manitoba Hydro	474-3971.	devenson@hydro.mb.ca
Newsletter Editor	Bert Phillips	UNIES Ltd.	633-6363	phillips@unies.mb.ca
Roster	David Stones	Wardrop Engineering	272-1331	dstones@shaw.ca
Special Events	Tom Beggs	Tom Beggs Agencies	953-1900	tombeggs@mts.net

ASHRAE Region XI Officers

Director & Regional Chair	Traci Hanegan	Coffman Engineers, Spokane		hanegan@coffman.com
Assistant Regional Chair	Erich Binder	Colt Engineering, Calgary		Binder.Erich@colteng.com
Technology Transfer	Bert Phillips	UNIES Ltd.		phillips@unies.mb.ca
Membership Promotion	Russell Lavitt	SMS Engineering		rlavitt@smseng.com
Student Activities	Doug LeCren	Colt Engineering, Anchorage		dlecren@nana-colt.com
Resource Promotion	Norm Grusnick	ECCO, Vancouver		normang@shaw.ca
Nominating Committee	Dale Carter	Dec Design, New Westminster		Dale@decdesign.ca
Nominating Committee	Doug Dunford	Portland		Dwdunford@aol.com
Regional Historian	Ivan Hall	ESC Automation, Edmonton		ihall@escautomation.com
Treasurer	Rob Craddock	Inland Metal Manufacturing, Regina		rob@inlandmetal.ca
Web Page Editor	Joseph Korus	Coffman Engineers		korus@coffman.com
CRC Chair, 2009	David Reames			daver@lseng.com

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.

Statements in this publication are not expressions of the Society or of the Chapter. Articles may be reproduced without permission. Please credit the source.

Visit ASHRAE Manitoba at www.ashraemanitoba.ca.

Visit ASHRAE at www.ashrae.org.