



## Roberts' Rants

Unruly  
Unedited  
Unplugged  
Unpublished  
Unregulated

Occasionally  
Unacceptable

Thought  
Provoking -  
YES!

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# Healthy HEATING

Comforting your mind, body and soles

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Having been in the construction design (grad BCET 1983) business long enough, eventually one finds our designs or projects being peer reviewed as part of a litigation procedure. This experience ranks right up there with dental work and any friendly visit by the auditors. A decade ago, I recall the words of a professional engineer hired for an arbitration hearing to evaluate our design for a large custom home... "after reviewing the architectural and mechanical drawings and comparing our load calculations to those in the construction documents we conclude this is not over or under designed...it is in fact a very good design." It could (should) have been a jubilant moment but sadly, the customer was still faced with resolving the thermal comfort and fuel consumption issues related to the building / mechanical interfaces. Jump ahead to April of this year, I sat as an observer and advisor to the Canadian Institute of Plumbing and Heating (C.I.P.H.) at the Canadian Commission on Building and Fire Codes meeting in Victoria, B.C. as they reviewed the contents of the new National Building Code. CIPH was there to state their case for the B214 Installation Code for Hydronic Heating Systems, since the Standing Committee on Houses had decided to reject referencing of the CSA B214 in Part 9 of the National Building Code, "CHBA is against the CSA B214 because it is "too prescriptive" and "it sets too high a standard.", "The Part 6 Committee, however, has recommended that CSA B214 be referenced under "Best Engineering Practices". Hmm. Here we have a national

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*In support of the CCBFC... the folks who rejected B214... it must be said emphatically, they believe whole heartedly there is a need for a B214 type code referenced in section 9 and have given both CSA and the B214 committee the opportunity to review the current document, and revise and resubmit for approval. No doubt greater dialoged between housing groups and HVAC and plumbing associations*

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representative body in C.I.P.H. who worked for years to bring the CSA-B214 to fruition with the aid and support of the Canadian HVAC industry, it is adopted as good engineering practice in Part 6 but "sets too high a standard" for Part 9. I'm guessing over 95% of the housing industry is not aware of **ASHRAE Standard 55**, (<http://www.ashrae.org/template/AssetDetail/assetid/35023>) **Thermal Environmental Conditions for Human Occupancy** nor industry report card - Decision Analyst **Home Comfort Survey**<sup>tm</sup> ([http://www.decisionanalyst.com/publ\\_data/2001/ComfortTech.asp](http://www.decisionanalyst.com/publ_data/2001/ComfortTech.asp)). The survey, which is done every two years, reported last, a nominal 50% dissatisfaction rate amongst consumers (If I recall correctly, Honeywell's survey [http://content.honeywell.com/home/todays\\_topics.htm](http://content.honeywell.com/home/todays_topics.htm) had results which were in and around 30% satisfaction) and when compared to ASHRAE's target of 80% we begin to see just how we're doing in delivering thermal comfort - between 30% to 50% below target!!). Guest of this site are encouraged to download the eBook Step 1 Home Owners Guide to Indoor Quality Comfort. It is a tool to understand our bodies' thermal systems and how they interact with buildings and spaces based on ASHRAE Standard 55. Anyways, listening to each member of the CCBFC committee support or reject the B214, I could not help thinking about certain jurisdictions in British Columbia who considered banning floor-heating systems because of litigation. While contemplating discussions with installers, manufacturers and distributors named in cases, I tried to remember the exact words in an Alberta Labor Safety Standards Branch Standata issued in 1991 to, "...clarify the design requirements of hydronic radiant floor heating systems so that an acceptable level of performance may be maintained for all installations." Essentially the two-page provincial directive required a review and approval of any residential hydronic radiant floor heating system by a registered architect and/or professional engineer. I know the folks at Safety Standards Branch and they are competent and capable folks...busy like all the rest of indus-

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I am impressed with the staying power of the radiant industry...having overcome so many obstacles - it's growth is primarily driven by consumers who are demanding better comfort from building contractors.

A must read...from Time Magazine!!!!: <http://www.time.com/time/nation/article/0,8599,361518,00.html>

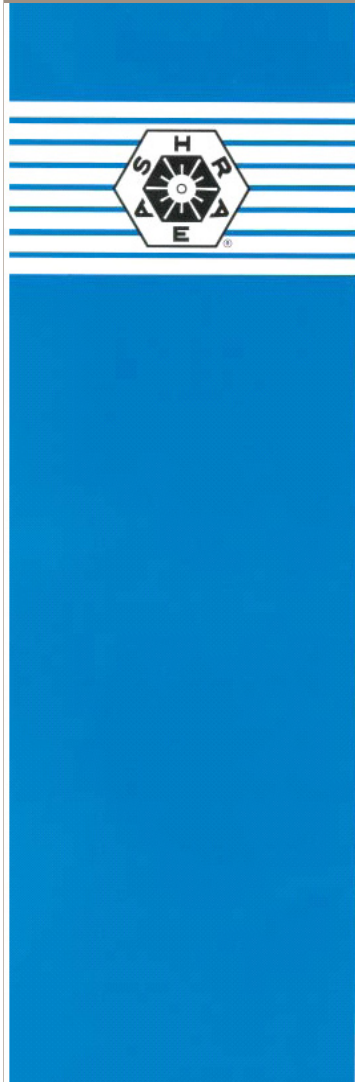
It's also interesting to note that when home owners become directly involved in the HVAC process selection for their new home - the sales of hydronics (primarily radiant) jumps by almost 7%! ( See US Census Bureau ). <http://www.census.gov/const/www/charindex.html>

This supports the often made statement that consumers are often talked out of using hydronics...thus the reason for this web site and its education driven purpose!

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try...but not too busy in 1991 to issue a method for protecting consumers from poor design and installation practices. That was 14 years ago and here was a national body in 2004 still trying to get industry to take radiant floor heating seriously. After hearing the commissions decision - I left bewildered in light of our European colleagues who have much higher standards than we do when it comes to HVAC systems. My confusion - as a global consultant, we Canadians are known for our skills as cold climate constructors but as consumers of power and fuel related to maintaining health, wellness and comfort in our buildings many feel the industry is decades behind our construction colleagues from other parts of the developed world. Why the conflict between industry and what North American radiant specific manufacturers and distributors experience to support failed radiant installations and equipment? In part, its because HVAC systems are designed for maximum loads which rarely occur, but in the few instances when the building / mechanical systems are tested to worst case conditions, it can be years after the consumers has been handed over the keys. Often the home has changed hands and the new owners are the first to live with an under performing system. Many times the failure does not show up mechanically but as a power and fuel cost. Unsuspecting owners remit payments to utility companies and never really know what they should be expecting until hit with severe conditions caused from anything such as temperature swings to rising water tables (direct influence over uninsulated heated slabs). Failure also shows up as a health related issues due to humidity levels, air velocities, and "less than acceptable radiant influenced "operative" temperatures due to a direct link between the physiological responses to a psychological and subjective thermal experience." The mechanical distribution chain ultimately deals with these incubated issues. As radiant in North America spreads ( see <http://www.radiantpanelassociation.org/i4a/pages/index.cfm?pageid=292> - estimated at over 182,000,000 sf last year) so has the garden variety "Popular Science" project approach to design - many systems are still con-

We'll spend on average 80% of our time inside our homes or offices...which is why our health, wellness and comfort is directly influenced by the spaces we occupy...owners are advised to look into this document...



ANSI/ASHRAE Standard 55-2004  
(Supersedes ANSI/ASHRAE Standard 55-1992)

# ASHRAE STANDARD

## Thermal Environmental Conditions for Human Occupancy

Approved by the ASHRAE Standards Committee on January 24, 2004; by the ASHRAE Board of Directors on January 29, 2004; and by the American National Standards Institute on April 16, 2004.

ASHRAE Standards are scheduled to be updated on a five-year cycle; the date following the standard number is the year of ASHRAE Board of Directors approval. The latest copies may be purchased from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: [orders@ashrae.org](mailto:orders@ashrae.org). Fax: 404-321-5478; Telephone: 404-636-9400 (worldwide) or toll free 1-800-527-4723 (for orders in U.S. and Canada).

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When addenda or interpretations to this standard have been approved, they can be downloaded free of charge from the ASHRAE web site at <http://www.ashrae.org/template/TechnologyLinkLanding/category/1631> or <http://www.ashrae.org/template/TechnologyLinkLanding/category/1686>.



**AMERICAN SOCIETY OF HEATING,  
REFRIGERATING AND  
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1791 Tullie Circle, NE • Atlanta, GA 30329

“The purpose of this standard is to specify the combinations of indoor thermal environmental factors and personal factors that will produce thermal environmental conditions acceptable to a majority of the occupants within the space.”

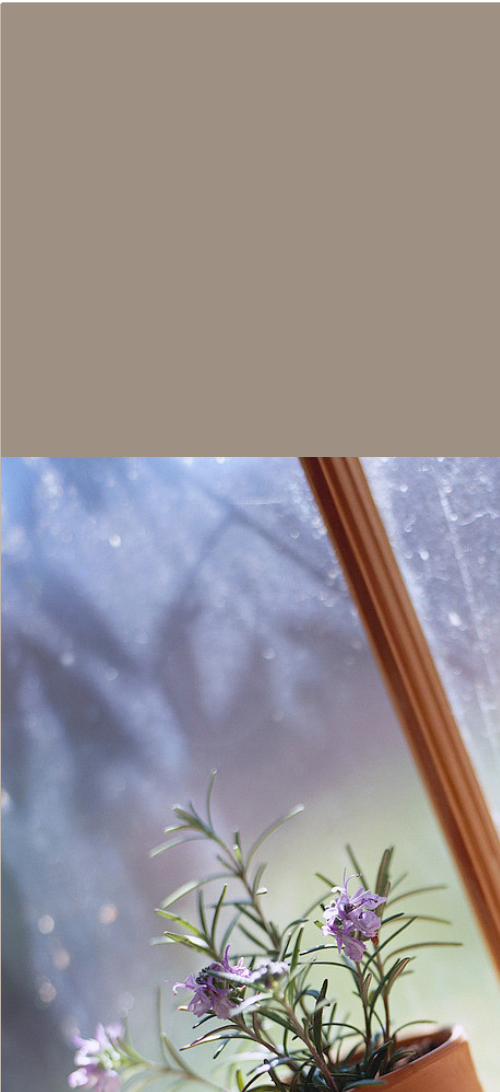
sidered home based experiments - this despite hundreds of millions of dollars in radiant science research dating back over 70 years and literally decades of design and installation refinement. It's this world class research, which helped mechanical engineers like consultant Dr. Simmonds, P.E. (IBE Group), and Dr. Olesen, P.E. (Wirsbo) to design a two million sq. ft. radiant floor

cooling system for the new International Airport in Bangkok. Here in Canada, HVAC can't get a simple code for residential hydronic heating and in other parts of the globe, code regulated radiant cooling is in use full force...what will happen when we see unregulated radiant cooling experiments being installed here in Canada?

Not surprisingly, the automotive and space industry is ahead (once again) of the building industry ( see <http://www.ott.doe.gov/coolcar/manikin.html#sensory> ) in funding radiant heating and cooling research in vehicles despite the fact that humans spend over 80% of their time inside the home or office in comparison to their favorite mode of transportation... (Calgary Herald, August 20, 2004... "Ford announces cooled seats to be added to their heated seat offering) so consumers may find themselves comforted by radiant (or hybrid forms thereof) in their cars long before it becomes mainstream in housing...great news if your under

45...depressing if your heading into a place of retirement.

The good news... industry has been prompted to push for radiant hydronics education by a collection of associations including C.I.P.H. and recently H.R.A.I. (Heating



We'll be presenting the key topics from ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy, at CIPHEX West, Calgary, Alberta, November 2 & 3, 2004

To Register:

[www.ciphexwest.ca](http://www.ciphexwest.ca)

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Refrigeration and Air Conditioning Institute of Canada) whom with its membership and federal funding from NRCan through the R2000 housing program have completed the first of its radiant hydronics design certification course in Calgary with follow up programs scheduled for Vancouver, Ottawa, Toronto and Halifax. Along with manufacturers and installers who have finally begun to see the benefits from integrating, and standardizing with pre manufactured HVAC systems the industry is experiencing a surge in professional installations.

*“It is commonly estimated that persons in economically developed countries spend at least 80% of their time indoors. This suggests that the quality of the indoor environment can have a significant impact on comfort, health, and overall sense of well-being.”*

Developing an Adaptive Model of Thermal Comfort and Preference, FINAL REPORT, ASHRAE RP- 884, March 1997 , Richard de Dear, Gail Brager, Donna Cooper, Macquarie Research Ltd., Macquarie University, Sydney, NSW 2109 AUSTRALIA Center for Environmental Design Research, University of California, Berkeley, CA 94720 USA, “Results of Cooperative Research

Education and standardization is certainly one of the keys to eliminating failures and improving performance. Consumers and builders are wise to collaborate with suppliers/installers who share this belief.

**RANT ON!**



