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# ASHRAE LONDON CANADA CHAPTER #116

**TOPIC**

**ASHRAE Legacy Night**

**&**

**Approaching Energy Reduction on  
University Campuses**

**SPEAKER**

**Darryl K. Boyce, P.Eng**

**ASHRAE Society President-Elect**

**MONDAY FEB 25/2019**

5:15PM – SOCIAL

6:15PM – DINNER

7:15PM – PRESENTATION

**RESEARCH PROMOTION NIGHT**

**MEETING LOCATION**

**Best Western Lamplighter Inn**

**591 Wellington Rd, London**

PLEASE USE PALPAL – ADVANCED PAYMENT BEFORE MEETING

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**Please register on the web site if you will be attending.**



## **Chapter President's Message**

Thank you to all who joined us for our January meeting despite the treacherous conditions that night. I personally felt it was well worth the journey to listen to Dr. Stephanie Taylor speak about how humidity plays a crucial role in reducing infections and improving IAQ. A fascinating topic that deserves attention in all spaces.

At our February meeting we are very fortunate to have Mr. Darryl Boyce speak about his profession, ASHRAE career and facilities management energy conservation strategies. Darryl has strong roots in London and through hard work and passion has been chosen as the next President of ASHRAE among many of his successes. Considering Darryl's legacy and heritage I hope you can all make it out and give this fine gent a round of applause!

Our February meeting is Research Promotion night as well so please embrace the cause and show your support. Any and all support is greatly appreciated.

Please mark the calendars as this will be a meeting to remember!

Thanks for your continued support and look forward to seeing you all on Monday.

**John Freeman**  
**ASHRAE London Canada Chapter**  
**Chapter President 2018/2019**

## **ASHRAE Membership**

If you know a colleague that may benefit from an ASHRAE membership, please let me know.

**Rajan Deenath**  
**ASHRAE London Canada Chapter**  
**Chapter Membership Promotion Chair 2018/2019**

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**TOPIC**

**ASHRAE Legacy Night  
&  
Approaching Energy Reduction on University  
Campuses**

**SPEAKER**

**Darryl Boyce**

ASHRAE PRESIDENT ELECT

Darryl Boyce is the current President-Elect of ASHRAE and is the Special Advisor to the Vice-President (Finance and Administration) at Carleton University in Ottawa, ON. He originally joined Carleton University as Director of the Department of Physical Plant in 1998 and was promoted to the position of Assistant Vice-President (Facilities Management and Planning) in 2007. He went to Carleton having spent the previous twelve years with the University of Western Ontario where he served as Associate Director, Facilities Engineering and Construction directing activities related to alterations, new construction, energy management, and utilities operations.

Darryl has been a member of ASHRAE since 1983 and has served on numerous Society Committees over the years. Additionally, Darryl has served on the ASHRAE Board of Directors as a Director, Regional Chairman (Region II), a Director-at-large, Vice-President and Treasurer. Mr. Boyce is the Past President of the Ontario Association of Physical Plant Administrators (OAPPA), Chair of the Canadian Association of University Business Officers (CAUBO) National Facilities Management Committee, and a member of the Association of Higher Education Facilities Officers (APPA) Information and Research Committee. He completed the Mechanical Engineering Technology Program at the British Columbia Institute of Technology and received a Bachelor of Science Degree in Mechanical Engineering from the University of Alberta.

**ASHRAE.ORG**

One year ago, ASHRAE launched its newly redesigned website!

Check out some of the new and updated pages available on [ashrae.org](http://ashrae.org):

90.1 Portal

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eLearning Corporate Program

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Updated and Improved

ASHRAE Technology Portal

Government Affairs

Standards Review Database

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ALSO, engage with ASHRAE year-round:

Download **ASHRAE 365** (it's free!)

## Chapter Upcoming Meetings

**Mon Mar 25/2019 - Transforming an Existing Building  
into a High Performing Facility**  
Jim Newman, ASHRAE Distinguished Lecturer

**Thur April 18/2019 – webcast: THE FUTURE OF REFRIGERANTS  
UNITARY AND VRF SYSTEMS**

**Mon June 3/2019 – Annual Golf Tournament**  
Forest City National Golf Club

\*\*\* be sure to check web site for latest information \*\*\*

<http://LondonCanada.AshraeChapters.org>

## ASHRAE RESEARCH <http://www.ashrae.org/contribute>

Local London ASHRAE Members have already contributed more than \$5,000 to ASHRAE Research for the 2018-2019 year. Please consider a contribution. All funds stay in Canada to improve the HVAC&R environment thru research.

Since 1960, ASHRAE has sponsored research studies at universities and research firms. The results of these studies have been used to prepare chapters in the ASHRAE Handbook series; as foundational material in special publications; in the formulation of standards; to train university students as they prepare for service in the HVAC&R industry; and to spread the knowledge gained through presentation at Society Conferences and publication in ASHRAE Transactions or conference proceedings.

ASHRAE currently has 59 active research projects.  
The total value of these projects is \$10.6 million.  
Average cost: \$159,696

Since 1959, ASHRAE has sponsored 907 projects with a combined value of \$76 million.

**Phil Cook**  
ASHRAE London Canada  
Research Promotion Chair 2018/2019



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## January Chapter Meeting Summary

ASHRAE Distinguished Lecturer, Stephanie Taylor presented Health as a Building Performance Metric. As hospitalization is the third leading cause of death in the US, the building environment is very important. Healthcare Associated Infections (HAIs) are the main cause of patient illness. Studies evaluated the patient room environment and HAIs. It was found that people need to be in an indoor environment with the relative humidity between 40 to 60% to reduce HAIs.

A copy of the presentation can be found on the ASHRAE London Canada Chapter web site:

<http://LondonCanada.AshraeChapters.org>

## Professional Development

Need hours for your professional development requirements?

Professional Engineers Ontario requires members to have yearly professional development training recorded through the Practice Evaluation and Knowledge (PEAK) program. Other groups also require continuing education.

Attend a chapter meeting to claim 1 hour towards your training.

### ASHRAE

**Free Download - The Strategic Guide to Commissioning FREE**

This free download communicates over-arching commissioning goals and objectives to help owners, facility managers, and O&M professionals improve overall building and system performance. This high-level guide describes the value, benefits and rationale for verifying all commissioned systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements (OPR) or the Current Facility Requirements (CFR).

Available in English and Spanish.

<https://www.ashrae.org/technical-resources/bookstore/commissioning-essentials>



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## ASHRAE HVAC COURSES

<https://www.ashrae.org/professional-development>

Learning Portal, ASHRAE Certification, Job Board, Educator Resources

### NEARBY TRAINING

#### HVAC Design: Level I - ESSENTIALS

**MAY 20-22, 2019 – TORONTO, ONT**

**Essentials** provides intensive, practical training ideal for recent technical or engineering school graduates, engineers new to the HVAC field, those who need a refresher in new technologies, and facility managers, sales representatives and others who want to gain a better understanding of HVAC fundamentals, equipment and systems.

#### HVAC Design: Level II- APPLICATIONS

**MAY 23-24, 2019 – TORONTO, ONT**

**Applications** provides instruction in HVAC system design for experienced HVAC engineers and those who have completed the HVAC Design: Level I – Essentials. The training covers the technical aspects of design and allows participants an opportunity to expand their exposure to HVAC systems applications to increase energy savings and improve indoor environmental quality.

**Online Courses** Also see: [www.ashrae.org/onlinecourses](http://www.ashrae.org/onlinecourses)

#### Humidity Control I: Design Tips and Traps

When: February 26, 2019, 1:00 pm to 4:00 pm, EDT

#### Complying with Standard 90.1-2016: HVAC/Mechanical

Tues, March 5, 2019, 1:00 pm to 4:00 pm, EDT

#### Air-to-Air Energy Recovery Application: Best Practices

Tues, March 19, 2019, 1:00 pm to 4:00 pm, EDT

#### Designing and Operating High-Performing Healthcare HVAC Systems

Tues, April 2, 2019, 1:00 pm to 4:00 pm, EDT

#### **NEW!** Choosing the Right Energy Code for Your Project: IECC 2018 or ASHRAE Standard 90.1-2016

Part 1 - Tues, April 16, 2019, 1:00 pm to 4:00 pm, EDT

Part 2 - Thursday, April 18, 2019, 1:00 pm to 4:00 pm, EST

(Registrants must attend both parts in order to receive credits)

And several others



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### JOB POSTINGS

See web site for more information: <http://londoncanada.ashraechapters.org>



## **ASHRAE NEWS**

**ASHRAE Toronto Chapter** announces our joint event with BCxA and BOMA on **March 4th, 2019** featuring:

Afternoon Seminar - "The Path to Low Carbon Buildings"

Dinner Meeting - "The Future of Smart Grid"

### **AFTERNOON SEMINAR: "The Path to Low Carbon Buildings"**

The building industry has recently seen a series of efforts in pursuit of low carbon buildings. The recognition of the link between green house gas emissions and the use of fossil fuels in buildings suggests the industry should work towards a carbon free future. This seminar will look at various aspects of building design and operation that will lead to lower carbon buildings.

1. Heat Recovery in Commercial Buildings
  2. Multi-residential GAHP Retrofit Case Study
  3. Overview of Reporting of Energy Consumption and Water Use Regulation
  4. Selling Energy Conservation: Business Case Prioritization to Improve Everyone's Bottom Line
  5. CaGBC's Zero Carbon Building Standard
- Discussions and Questions session moderated

### **DINNER MEETING: The Future of Smart Grid**

DISTINGUISHED LECTURER - David Underwood, P.E.

This introduction to Standard 201 will define an abstract, object-oriented information model to enable appliances and control systems to manage electrical loads and generation sources to communicate information about these electrical loads to the utilities and other electrical service providers. The determined model will allow "smart grid" interaction between electrical loads and electrical generation facilities.

See: <http://www.TorontoAshrae.com>

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## **Delivery Information for the 2019 ASHRAE Handbook – HVAC Applications**

The 2019 ASHRAE Handbook – HVAC Applications will ship the first of June, 2019 to full dues paying Members and Associates who elect to receive the printed Handbook. These members should verify the mailing address ASHRAE has on file before May 1, 2019 to ensure the Handbook is delivered to the correct address.

How to verify/update your address:

Log in to [ashrae.org](http://ashrae.org) to verify and if needed, update your address

OR email your correct address directly to Tewana at [tparris@ashrae.org](mailto:tparris@ashrae.org), one of our Customer Contact Specialist who would be happy to assist you.

### **PDF Handbook in Technology Portal**

Who gets it: Participants in the Developing Economy Program, members who elected to receive a PDF only version, everyone who also receives the printed copy of the Handbook, or those who purchase the printed Handbook.

An email will be sent in June 2019 as a reminder to sign in to the Technology Portal to access the PDF version of the 2019 ASHRAE Handbook. At that time, simply use your ASHRAE member login information to sign in and download the entire volume or individual chapters. (You will not be able to access the 2019 ASHRAE Handbook before June 2019).

Thank you for being an ASHRAE member and please contact [ashrae@ashrae.org](mailto:ashrae@ashrae.org) with any questions.

# ASHRAE 90.1-2016 – The Next Wave of Energy Standards

## HVAC-Related Changes

ASHRAE Standard 90.1 has been the basis of many energy codes as it pertains to building envelope loads, minimum energy requirements for HVAC equipment/systems, lighting, water usage, and the controls that bring it all together. The path that standards take to eventually become code is always changing but if history tells us anything, it's that the code enacting authorities have consistently relied on ASHRAE to identify the areas that have the maximum potential for energy and energy cost savings.

The 2016 edition of the standard includes numerous energy-saving measures that were a direct result of feedback and proposals that were put forth by the public and volunteers from the 90.1 committee. In total, there were more than 125 addenda added to the 2013 (previous) revision. Among the biggest changes was a reformatting of the document to make it more suitable for digital use. Some of the main HVAC-related changes are as follows:

***Note: This is by no means a full list of the 90.1-2016 changes. The intent of this article is to provide reference to some of the updated standard sections that would be of high interest to the HVAC Engineering/Contracting community. The full list of addenda can be viewed in Appendix H 'Addenda to ANSI/ASHRAE/IES Standard 90.1-2013'.***

1. **5.1.4.2** - Updated climate zone classification - 90.1-2016 updated to the classifications published in ASHRAE Standard 169-2013. These changes may affect design criteria in multiple areas, particularly where the classification dictates requirements for building material considerations (insulation, glazing).

### **Mandatory Section (6.4) Changes**

2. **6.4** - Replacement HVAC equipment is now required to meet most 'Section 6' requirements. Previously "like for like" equipment was exempt from meeting current requirements for new HVAC equipment (other than min. efficiency). This new version states replacement equipment is now obliged to meet several mandatory requirements. Including but not limited to: DCV for single zone systems, off-hour scheduling, and set point controls.
3. **Table 6.8.1-15** - DOAS Equipment minimum efficiency guidelines. With increasing industry interest in dedicated outdoor air packaged rooftop equipment, a new class has been added ('DOAS'). The section directly references a recently created AHRI920 standard, which reflects different operating conditions an outdoor air unit can expect to see and rates it accordingly. The basis of comparison for these units is detailed as moisture removal efficiency (MRE) and ISMRE for off-design rating.
4. **Table 6.8.1-14** - Pool dehumidifiers and CRAC units have been added to the scope of 90.1 minimum efficiency requirements.
5. **Table 6.8.1-9** - VRF equipment – 90.1-2016 changes some of the part-load requirements detailed in the 2013 version. Part in reason due to new test procedures as well as improvement in stringency.
6. **6.4.3.12** - Economizer fault detection mandatory on packaged unitary DX air conditioning units. The intent of this area is to identify when equipment is not economizing properly when conditions allow due to whatever reason (sensors/controls not functioning as intended). This has been required in California for a number of years already.



7. **6.4.3.11** - Chiller-plant monitoring requirements to have efficiency and energy use measurement and reporting based on climate zone and plant size. This section also indicates for the data to be recorded and trended every 15 minutes while maintaining at least 3 years of data.

#### **Prescriptive Section (6.5) Changes**

8. **6.5** - Replacement equipment prescriptive paths (in addition to mandatory requirements in 6.4)
9. **6.5.3.2.4** – Return and relief fan control. Compliance requires that the return/relief fan control must maintain the building pressure directly or alternatively indirectly through supply-return airflow tracking. Building pressurization is critical for conserving energy, as well as maintaining the health of the building.
10. **6.5.3.3** – All multiple-zone VAV systems must use ventilation optimization unless their exhaust is too high (>70%) relative to the OA% that is being brought in to the building.
11. **6.5.4.2** – Updated requirements for pump VFD control. The result of the evaluation of pump control by climate zone prompted a new table of VFD requirements for heating-water pumps in these various areas.
12. **6.5.4.4** – Alternative to pump-pressure reset based on critical valve position. Introduces the ability for a reset chilled-water control strategy to keep one valve nearly-wide open opposed to pump-pressure optimization.
13. **6.5.4.7** – Chilled water cooling coils should be selected for at least a 15F delta T with at least 57F leaving coil water temperature. There are exceptions to this but an extensive analysis submitted to 90.1 showed that system (fan(s), pump(s), tower(s), chiller(s)) energy consumption and first costs are reduced when chilled-water coils are selected for higher water temperature differentials and lower flow rates.

*Jeff Armstrong, BESC*  
*Account Manager at Trane London*

The information presented in this article is for informational purposes only and does not constitute design advice – the sections are directly sourced from 90.1 and believed to be factual. Final design and application decisions are the responsibility of the designer.

#### **References:**

American Society of Heating, Refrigerating, and Air-Conditioning Engineers. 2016. ANSI/ ASHRAE/IESNA Standard 90.1-2016: Energy Standard for Buildings Except Low-Rise Residential Buildings. Atlanta, GA: ASHRAE.

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ASHRAE Standard 90.1-2016 User's Manual. Atlanta, GA: ASHRAE. Available at [www.ashrae.org/bookstore](http://www.ashrae.org/bookstore).