

## Distinguished Lecturer Summary

### Lew Harriman, FASHRAE

Lew Harriman is Director of Research at Mason-Grant Consulting in Portsmouth, NH. He has 35 years of experience researching and solving problems related to energy, humidity and moisture in buildings and industrial processes.

Lew was the lead author and project manager for the *ASHRAE Humidity Control Design Guide*, and also for the *ASHRAE Guide for Buildings in Hot & Humid Climates*. He has served as Chair of ASHRAE Technical Committee 1.12 (Moisture Management in Buildings), and also as Chair of the Document Revision Committee for the ASHRAE Position Document on *Limiting Indoor Mold and Dampness in Buildings*. In recognition of his accomplishments, in 2010 Lew was elected a Fellow of ASHRAE and in 2012 he received an appointment as an ASHRAE Distinguished Lecturer.

Lew received his degree in Visual studies/Architecture from Dartmouth in 1971, where he also served as a Spanish language instructor. He served five years in the U.S. Air Force as a Captain in the Engineering & Services Division of the Headquarters, Strategic Air Command, and ten years working as application engineer and new markets manager for an international manufacturer of precision industrial dehumidification systems. For the last 25 years, Lew has been a building science consultant, building forensic investigator, researcher, lecturer and author. He has lectured on the topics of humidity control design and trouble shooting, ventilation system design, building moisture management, infrared analysis of building systems, mold prevention and building energy retrofits for architects, engineers, contractors and building operators throughout North America, Europe and Asia.

### Lecture Topics

#### **1. Better Buildings in Hot & Humid Climates - New ASHRAE Design Guidance**

Lew Harriman is the lead Author and Project Manager for ASHRAE's *Design Guide for Buildings in Hot & Humid Climates*. Developed at the request of ASHRAE chapters in humid climates in both the Americas and in Asia, this book has, for the first time, collected and integrated suggestions from more than 30 professionals who have practiced for decades in humid climates. Suggestions are included for architectural design and construction management in addition to design, construction and operation of mechanical systems. This talk has proven popular for joint ASHRAE-AIA meetings, and also for joint meetings of ASHRAE and Facility Management & Operations Professionals

#### **2. Diagnosing & Fixing Humidity Control Problems in Real-World Buildings - Tools, Techniques, Case Histories and Practical Suggestions**

In many ways, design is a perfect world with no physical problems. But the real world sometimes makes a hash of even the most elegant and well-considered designs. In this talk, Lew Harriman discusses the practical aspects of what to do when things are going wrong with humidity control. Based on his 35 years of experience with designing, diagnosing and fixing humidity control problems in buildings of all types, this talk is focused on what to do when "That humidity problem has to be fixed before the end of the week!!"

#### **3. Real-World Integrated Design - Case Histories of Both Productive and Problematic Interactions Between Architectural Designs and HVAC Systems**

Integrated design for buildings offers the potential for major, world-class reductions in energy, as well as improvements in comfort and cost reduction. But the process is not always smooth. This talk describes some of real-world interactions between buildings and HVAC systems in daily operation. With this information, both Architects and Mechanical Engineers will understand ways to improve buildings and HVAC systems for the benefit of the occupants as well as the benefit of building owners. This lecture has proven popular with Architects, Energy Auditors and Building Managers in addition to Mechanical Engineers and students.

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### **4. The ASHRAE Position Document: Limiting Indoor Mold & Dampness in Buildings**

Indoor mold has been a controversial, expensive and disruptive problem in buildings all over the world. In 2012, the ASHRAE Board of Directors approved a major revision to the ASHRAE position document on indoor mold. Lew Harriman chaired the volunteer committee that researched, consolidated and summarized what is known and not known about indoor mold within the ASHRAE community. In this talk, Lew discusses some of the key issues and recent research conclusions about indoor mold, and provides some specific suggestions from the ASHRAE position document for HVAC designers, contractors, architects, builders and building operators who want to understand and avoid mold problems in buildings.

### **5. Humidity Control Design - Current ASHRAE Guidance & Suggestions for Simpler Solutions**

Lew Harriman is the Lead Author and Project Manager for the *Humidity Control Design Guide*, the landmark 2001 ASHRAE reference book that has recently been updated, translated and published in both Japanese and Chinese. In this talk, Lew summarizes the specific guidance and suggestions from dozens of contributors to the book, for the types of systems and buildings commonly built in the lecture location. The information provided in this lecture is separately customized for local conditions in Asia, Europe and the Caribbean as well as for locations all over North America.

### **6. Building Diagnostics Using Thermal Imaging - Practical Tools, Techniques and Case Histories**

The costs of thermal imaging tools and techniques have fallen rapidly over the last 10 years, as thermal cameras have become more affordable for those who design, troubleshoot and operate buildings. This talk describes examples of the types of problems that can be found and fixed using this technology, and also the false conclusions that are easy to reach without thoughtful understanding of what a thermal camera can and cannot show the building investigator. Lew Harriman has used thermal cameras for building investigations for more than 10 years, and was the Lead Author of the US General Services Administration's "Protocol for Thermal Imaging Analysis of Building Enclosures." The talk includes examples of investigations of different types of problems in Federal buildings in several North American Climates.

### **7. Case Histories - Low-cost, Web-based Remote Datalogging of Building Moisture and Control of Single-zone HVAC Systems.**

Remote monitoring and control of buildings and HVAC systems has become common practice in large commercial and institutional buildings. Less common is remote, web-based monitoring & control for single-family homes and for simple single-zone commercial buildings. In this talk, Lew Harriman describes case histories of two economical systems that have proven durable, reliable and very helpful in understanding, adjusting and troubleshooting buildings and systems at long distances.

### **8. State-of-the-art Residential Energy Retrofits - Best Practices for Single-family Homes**

In recent years, the technology and the skills for making major reductions in heating and cooling energy in single-family homes have advanced rapidly. Reductions of 40 to 60% in the annual cost of heating and cooling are not only possible, but have been common in parts of the U.S. where contractors practice the techniques now known as "Measured Home Performance." In this approach, all of the energy features of the home are upgraded at the same time, in a highly integrated fashion, based on continuous in-process measurements of key variables. This talk describes the essential elements of these tools and techniques, along with examples of annual utility cost reductions.

## Scheduled Program Descriptions

**Tim Dwyer - CIBSE Webinar** Feb 2013 (45-60 min)

### **Humidity Control Is Where Architecture Meets HVAC - Problems and Solutions for Real-World Buildings**

Sooner or later, every HVAC designer and every architect runs into a problem with humidity control or its consequences; dampness, mould growth, dripping pipes or complaints asking why it's so blasted cold in here... since it's the summertime. Sometimes—to our annoyance—these problems even occur in one's own building or our home or that of a relative, brought to our attention by an angry colleague or spouse.

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This webinar highlights three examples of real-world buildings: a single-family home, a community clinic and a military training building. These were all built with professional care, but all had humidity problems because of the unexpected interaction between the building's enclosure and its HVAC systems. Solutions were simple, but they demanded understanding, cooperation and action that crossed the outdated and counterproductive divide between engineering, construction and architecture.