November Meeting 2014

USING ASHRAE’S IAQ PROCEDURE TO REDUCE OUTSIDE AIR INTAKE, CORRESPONDING AC TONNAGE AND ENERGY USE

Speaker: Lawrence Sunshine, Vice President, Plasma Air International

The seldom used and little known IAQ Procedure from ASHRAE’s Standard 62.1 allows engineers and building owners to reduce the amount of required outside air by evaluating the contaminant levels before and after air purification. The procedure meets the Ventilation Exception of the International Mechanical Code (IMC). It is simplified and presented in a straightforward manner.

Presentation Agenda
- The positive effects of a higher ion count
- How Bipolar Ionization technology works
- Product performance – laboratory testing
- Products
- Selection guides
- Target applications
- ASHRAE’s IAQ Procedure (and the IMC Exception)
- Cost analysis of a typical project
- How to design an IAQ Procedure project
- Validation case study
- Worldwide references
- Technology summary

About the Speaker: Lawrence Sunshine brings with him more than 25 years of experience as both an engineer and executive in the HVAC and Indoor Air Quality industries. As Vice President of Plasma Air International, he oversees their expansion into the North American IAQ market while advancing the company’s global business development strategy.

Prior to joining Plasma Air in 2004, Mr. Sunshine was the VP of Marketing for Lindab, the world’s largest duct system manufacturer, where he was instrumental in winning national accounts such as Gap, Wal-Mart, Walgreen’s and Publix Supermarkets. He was also Lindab’s representative to the international steering committee for the company’s AutoCAD® driven software application, CADvent®. Prior to joining Lindab, Mr. Sunshine began his career in 1988 as an HVAC engineer and Project Manager at Joseph R. Loring and Associates in New York.

He has been an active member of ASHRAE, appointed a board member of SPIDA, and served as guest speaker at various industry events.

Correction: 5:30pm

WHEN: Tuesday Nov 18, 11:30 am
COST: $25 Members, $30 for Guests
WHERE: Pappadeaux Seafood Kitchen, 5011 Pan American West Fwy NE, Albuquerque, NM
RSVP to Joseph Higham by Monday Nov 17th by email jhigham@climatec.com or online at newmexicoashrae.org

President’s Message

Members,

I have had some time lately sitting in the hospital to observe how the nurses, doctors, and staff work together and amazingly serve their patients. I have also noticed how a hospital would not work if our professions (engineers, contractors, and equipment suppliers) could not create and provide the environment and services which make it run. Whether it is a hospital or just a simple office building our industry is a vital part to creating a functioning facility that people want to and can work and live in.

Continued on page 2
**President’s Message (continued from page 1)**

ASHRAE’s goal is to support and provide what we need to do our jobs. This is also the goal of the local Chapter: to help the Chapter members with informative Chapter meeting programs, valuable seminars, fun events, and facilitate with Nationals. The board is made up of some great individuals that want to make this Chapter the best it can be and serve you the members. I will ask all of you for your help also.

Please let us know what type of programs you would like to see, join us for the Chapter meetings, and let us know if you have a topic that you would like to present. Please support us by being active members and encourage the younger members of your office to be members as well.

We are trying to strengthen the Chapter so it can better support the members, which is one of the ironies of organizations like ours. To better support the members we need a little more help from the members. This is a great profession and deserves a great organization to support it.

David Graham  
Chapter President  
2014-2015

**From the History Books**

January 1968

Chapter Officers were:

- **President:** J. Wahlen  
- **President-Elect:** W. McCord  
- **Secretary:** Barc Barnett  
- **Treasurer:** Robert Friggens

The speaker for the meeting was William Zunkard of Cleaver-Brooks. He discussed “The application and Mis-application of Hot Water Boilers”.

**NM ASHRAE is Now Accepting Job Postings!**

We are now accepting ads for local jobs to be placed on the chapter website at [newmexicoashrae.org/jobs/](http://newmexicoashrae.org/jobs/)

To place an ad, the employer must have at least one NM ASHRAE member working in the firm or pay a fee of $50 per month per ad. Each ad will be posted on the website and in the Thin Air Bulletin for 30 days unless renewed by the employer.

The ad must be in the following format:

- **Job Title:**
- **Company Name:**
- **Website Link:**
- **Contact Information:**
- **Short Description (50 word limit):**

Submit job postings to Stacey Chan at skchan@bpce.com and indicate ASHRAE member name within the firm.

**From Membership**

Please login to ASHRAE and check your information.

Are you teetering on joining or renewing? Know someone? Call me and let’s discuss.

Improving HVAC&R for the built environment is not just a goal, it's part of the ASHRAE culture. Members like you share a common interest in providing engineering solutions that reduce energy needs, improve air quality, and set standards that help the entire profession around the world.

Your membership in ASHRAE supports the improvement of quality of life around the world, making big ideas a reality while also providing you with professional resources, knowledge, and connecting with your HVAC&R peers around the world. Your membership also affords you numerous benefits to stay connected with your peers, gain insight on industry issues and remain in the know about your profession.

Last Month We Had Tom Watters Re-Join – Thanks Tom & Welcome Back!!!!!!
Young Engineers in ASHRAE Night at Dave and Buster's

SKEEBALL! BASKETBALL!
GAME CARD PROVIDED by ASHRAE

Where: 2100 Louisiana Blvd NE
When: November 20th, 2014
Time: 5:30 - 7:30 PM
From Research Promotions

I would like to thank all that contributed to ASHRAE Research for the 2013-2014 year.

Thank you!!

Climatec Inc
Mechanical Representatives - Albuquerque
Energy Control Incorporated
Automated Control Systems - Albuquerque
Energy Balance & Integration, LLC
Dr Maurice W Wildin, PhD
Mr Alan F Weitzel
Scoggin Mechanical Industries, INC.
Mr Lanny Sigler
Boyd Engineering Supply Company Inc
CAC Inc
Mr Michael E Dexter
Mr Michael J Weix
Mr Stephen Forner
Nick Nellos Memorial
Mr Scott R Salisbury
Miller Bonded Inc
Mr Morgan B Royce
Mr Kyle Best
Mr Patrick H Watkins
Mr Terry L Walker
Ms Erin Coffman
Mr Gary E Grange
Mr Charles W Scoggin
Mr Gordon L Dixon
Mr Allen A Anaya
Mr Jim Asperger
Mr Joseph B Higham
Mr Deward W Stegall
Mr Eric O Korn
Mr John W Scott

I bet you didn’t know that your contribution will go to directly support Research being conducted in our own Region. Overall, your support and the support from thousands of members like you is helping to fund more than $14 million worth of research worldwide this year.

If you’d like a list of research projects being conducted in the region or about specific topics, please let me know.

Thanks again for all your support and I look forward to seeing you at the next New Mexico Chapter Meeting.

Morgan Royce
New Mexico Chapter RP Chair
mbroyce@comcast.net

P.S. The 2014-2015 RP Campaign will begin shortly. Please contact me if interested in providing new or continued support.
## 2014-2015 New Mexico Chapter Board of Governors

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<tr>
<th>Position</th>
<th>Name</th>
<th>E-mail / Phone</th>
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<tr>
<td>Past President</td>
<td>Morgan Royce</td>
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<td>Research Promotion Chair</td>
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<td>President</td>
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<td>President-Elect</td>
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<td>Programs Chair</td>
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<td>Treasurer</td>
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<td>Bridgers &amp; Paxton Consulting Engineers</td>
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ASHRAE Announces Recipients of Student Design Competition; Applied Engineering Challenge

ATLANTA - Students who took part in ASHRAE’s 2014 Student Design Competition were challenged to do research and design for a research and design development facility. The 2014 student competition focuses on a two story office building in New York City with a research and development facility. ASHRAE student teams outside the United States were allowed to locate the building in the capital of their state, province or country.

ASHRAE also announces the recipients of the Applied Engineering Challenge, which focused on the need to improve indoor air quality (IAQ), particularly in residential applications in developing countries. Among the 39 entries from 13 countries, four were awarded first place in the categories that the competition and challenge offer.

First place in HVAC Design Calculations is awarded to a team from the University of Central Florida, Orlando: Christopher Erickson, associate engineer, Universal Creative, Orlando; Ian Faulkner, mechanical designer, exp U.S. Services, Orlando, Fla.; DJ Marshall, mechanical engineer, TLC Engineering for Architecture, Orlando, Fla.; Richard Suarez, quality engineer, Rockwell Collins, San Diego, Calif.; Kristian Jack Szymanski, Coral Springs, Fla.; and Ju Young Yu, Winter Park, Fla. Their faculty advisor is Gabriel Vazquez, Ph.D.

The team’s objective was to design a high efficiency HVAC system with long life cycle, and excellent indoor air quality while maintaining cost effectiveness. They selected variable refrigerant flow (VRF) systems with simultaneous heating and cooling and dedicated outdoor air systems (DOAS) with energy recovery. Other equipment included air valves for lab areas and high efficiency particulate absorption (HEPA) filters and exhaust fans to eliminate contamination.

A 20 ton DOAS unit, three condensing units and several heat recovery units were used to supply required air to all types of VRF units contained within the building. A separate 50 ton DOAS unit was used for lab areas due to the high air change requirement of the clean room and high exhaust rate in the four research and development areas. For each DOAS unit, an exhaust fan was used, and one additional exhaust fan was selected for emergencies only, such as in the case of a refrigeration leak.

The total cost associated with the selected systems was $570,203. The design encompasses efficiency, health and safety, comfort, functionality, longevity, flexibility and maintainability with a low life cycle cost.

First place in HVAC System Selection is awarded to a team from Kansas State University, Manhattan, Kans.: John Gaito, Kathryn Helmer, Lexie Oliver, Alex Pint, Megan C. Walkowiak and Gordon Zimmerman, all of whom are senior level students in architectural engineering. Faculty advisors are Julia Keen, Ph.D., P.E., HPBD, and Fred Hasler, P.E.

The students selected a ground source heat pump (GSHP) system where water is pumped through vertical piping in the ground, providing a heat source and heat sink for the heat pumps. The main water loop serves the heat pumps and DOAS allowing heat transfer between spaces to maximize energy efficiency.
The GSHP system met all the owner’s requirements in using the ground as a heat sink and heat source to serve the building. As a result, the energy savings are immense. This creates a low-cost, reliable, flexible, maintainable, sustainable system.

An unusual addition to the system was incorporation of a wall of vegetation created by attaching plants that do not require soil to a mesh grid. Given that the building is used for research and design, the exhaust and ventilation rates are significant and consume large amounts of energy. Ten small bio-walls are used to decrease energy consumption for the entire building by decreasing the required ventilation in the office spaces.

First place in Integrated Sustainable Building Design is awarded to a team from Montana State University, Bozeman: Elyse Casper; Theresa R. Lindenauf, Bozeman, Mont.; Terra Moran, materials engineer, Imperial Oil, Calgary, Alberta; Mary Peterson, project engineer in the commercial solutions division, 3M, Saint Paul, Minn.; and Martin Reaves, founder, Monolithic, Bozeman, Mont. Their faculty advisor is Kevin Amende, P.E.

For the HVAC systems, students implemented multiple systems with high efficiencies, using the nearby river as a heat exchanger. The main system -- a VRF system -- is more expensive upfront, but more cost-effective and energy saving throughout the life of the building. It was implemented to condition the open office, library, meeting rooms, mailroom and HR office spaces. It has the additional benefit of requiring no duct work; only the routing of small refrigerant lines.

Fresh air is pre-conditioned by a heat recovery ventilation unit that exchanges energy with exhaust air leaving the building. This recovers energy while improving air quality. Fresh air is vented directly into the fan coil units in the VRF spaces, first mixing and then distributing throughout the rooms. Fresh air for the computer server and research and design spaces is ducted into the heat pumps and blown into the rooms directly. Acoustic and filtration specifications were addressed through appropriate noise dampening and filtration products.

Review of data showed energy consumption was reduced by almost 70 percent; cooling load was reduced by over 60 tons; and carbon and greenhouse gas emissions were more than halved. The new design pays back after year twelve, and saves the owner almost $1 million by the end of 40 years. Although the design did not reach net-zero, the improvements were exponential. With a larger budget or new construction, the net zero goal could be realized.

ASHRAE also announces the recipients of the 2014 Applied Engineering Challenge, in which students were required to design and specify a small, portable air conditioner that must be affordable, maintainable and effective in the local cultural environment.

The first place Applied Engineering Challenge recipients are a team from California Polytechnic State University, San Luis Obispo: Juan Silva, sales operation, SYSERCO, Fremont, Calif.; and Nelson E. Echeverry, design engineer, Donald F. Dickerson Associates, Tarzana, Calif. Their faculty advisors are Steffen Peuker, Ph.D., and Jesse Maddren, Ph.D., P.E.

The system involves a series of measures that a family living in Mexico City can take to improve the IAQ in their house. Starting in the kitchen, a wood stove with a chimney attached was used to vent out the smoke caused from burning biomass. The stove provides heating during cold days, reduces pollution caused by inefficient cooking stoves and provides reliable operation.

Next, in the living room, a window fan was modified with an external air filter at the inlet of the fan, capturing most of the harmful contaminants and allowing fresh air to enter the house. With forced airflow, pollutants are dispersed, thus avoiding high concentrations. A window fan providing a capacity of 1400 CFM is sufficient to supply the entire house. For cooling, students chose a window unit, which helps in reducing humidity.

One major benefit is that units are portable and can easily be installed in a new or different home. Two financial tiers were created: one targets low to middle class families, providing equipment and devices to satisfy comfort needs and to improve healthy living, but with less expensive materials. The second tier for high to mid class families contains a power generator and window unit.

The projects will be shared at the 2015 ASHRAE Winter Conference, Jan. 24-28, Palmer House Hilton, Chicago, Ill. Also taking place at that time is the ASHRAE co-sponsored AHR Expo, Jan. 26-28, McCormick Place, Chicago.

ASHRAE, founded in 1894, is a global society advancing human well-being through sustainable technology for the built environment. The Society and its more than 50,000 members worldwide focus on building systems, energy efficiency, indoor air quality, refrigeration and sustainability. Through research, standards writing, publishing, certification and continuing education, ASHRAE shapes tomorrow’s built environment today. More information can be found at www.ashrae.org/news.

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