Spotlight on Maintenance

Newsletter

Spring 2006

Inside Edition

Ohio Public Facilities Maintenance Association

Visit Our Website at: www.opfma.org

President's Message

By

Constantin Draganoiu

Challenges always bring new Opportunities

The greatest challenge the New Year brought us so far is the resignation of Wayne King as the Chairman of the Conference Organizing Committee. A tough task has suddenly become tougher!

Wayne has done such an exceptional job in leading the committee over the last three years, that I rested assured of the outcome of the conference during this time. Due to new challenges in his work and family life, Wayne had to cut back in his involvement with the organization activities but will continue to support OPFMA as much as his new circumstances permit. We understand his decision and thank him for all the great work he's been putting in the OPFMA behalf for so many years!

Wayne offered to help the new chairman, Jake Jones, Director of Facilities Warren County Commissioners, whom I personally thank for accepting to take this great challenge on a short notice! Ron Atkins, former project supervisor with Mad River School District and now a retiree, Linda Champion, Housekeeper Manager at Cleveland State University, and Richard Greenwald, Schaeffer Oil/ Greenwald Enterprises, LLC - have also offered support and participation in 2006 Conference Committee works. Jake will need all the support that we could offer!

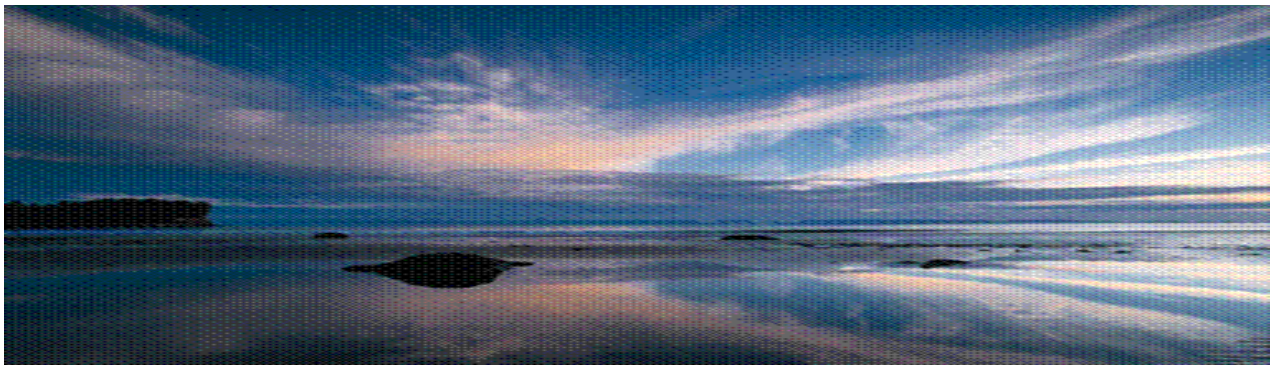
Other changes took place also!
The very important and vital Committee of Membership and Marketing will be chaired by Norman Sorge, Maintenance Supervisor at Medina City Schools District. Dale Girt, Facilities Director at Lorain Public Libraries, and Jim Duckworth, with ICS systems and an Associate Member, volunteered to work with Norm on membership and marketing matters.
The Publications and Education Committee was revitalized and it will be chaired by Ted Howell, Senior Project Engineer with Brewer-Garrett Co. - an OPFMA Associate Member.

The BOC program has started strongly this year. The first series of 2006 started in Columbus on Jan 27 and it is hosted by the first class Trane Co. facility. The support of Dr. Manny Anunike from ODOD/OEE was fundamental in securing this great facility for the whole course. We have 35 BOC students from 21 institutions from all regions of Ohio who were greeted by Trane Co. Columbus branch Director of training Mary Crespy and John Johns. I was also on hand to welcome them as well as some interested observers like Oscar Zanganeh, the Energy Specialist of the Office of Energy Services of the State of Ohio and Mark Wantage of the Ohio School Facilities Commission. They were interested in finding out first hand how the classes are organized and run, the level of technical knowledge presented, the instructor's presentation, etc. in order to assess the usefulness of the course. Professor Richard Wirtz, an excellent BOC Instructor also, thought the class. Oscar and Mark were positively impressed by the quality of the presentation, the professionalism of the attendance, and the organization of the class. Both have since accepted participation into the Ohio BOC Advisory Committee that start meeting this spring.

We'll keep everyone informed about the progress of the BOC program over the course of the year as it develops. Meanwhile the Columbus series continue as scheduled and a new series will start in Columbus in the next couple of months. Please visit the OPFMA internet site at www.opfma.org to learn more!

The OPFMA 2006 Agenda is positive and with new energy and enthusiastic people on Board, Ohioans in public facilities maintenance field could only benefit of a better support in their continue education.

Walk with OPFMA to a more promising tomorrow!



2006 Facts and Events ….

From Administrator's desk:

Special Thanks - TRANE Co!
It's well known that Trane Co. – Columbus is a strong supporter of OPFMA activities and consistently participates in our Annual Conference and Trade Show bringing the latest products and high quality services to Ohioans. The less known part is - its generosity!
Trane Co. is hosting the BOC Series, which started on Jan 27 2006, free of hosting fees including complimentary breakfast and refreshments. **A Very Special "Thank you**!" for TRANE Co. - We appreciate very much their generosity!

New BOC Instructors certified!
Mr. Sri Rahm is certified for BOC-104 Efficient Lighting Fundamentals. Mr. Rahm is a Senior Training Specialist for General Electric, also teaches Electricity and Magnetism at Case Western Reserve University.
Mr. Ted Howell is certified for BOC 102 Energy Conservation Techniques. Mr. Howell is a Senior Project Engineer with Brewer-Garrett Co. Attendees of last year Conference classified him as" Great presenter, enjoyable to listen to."
Mr. Steven B. Wubben, is certified for BOC 103 "HVAC Systems and Controls". Mr. Wubben an electrical engineer with multiple course certifications he teaches and coordinates Johnson Controls Institute customers across Kentucky, Indiana, Michigan and Ohio.
We wish them a very warm "**Welcome aboard!"** Our new instructors will be posted on the OPFMA web site shortly.

BOC Program General Presentation
Vinton County Schools' Assistant Superintendent, Ms. Mary Ann Hale, intending to organize a BOC Series at their facilities – as Lima City Schools did last year – inquired if a general presentation of the BOC program could be given to them. OPFMA immediately acted upon her request and organized the meeting. On Feb 21st 2006, Mr. John Fetters, BOC instructor and nationally recognized specialist in lighting systems, made the presentation to a large group of Vinton County Schools' representatives.

Mark Your Calendars
With new energy on Board and an enthusiastic Conference Committee we start planning for the **2006 Annual Conference & Trade Show.** It will be hosted again by Marriott North Columbus. Be assured the room temperature will be lower!
Mark your Calendars and start planning to attend the greatest yearly event for the Ohioans maintenance front liners.

- *** Conference 2006 & Trade Show on Nov 13 2006**
- *** Conference 2006 – Workshops on Nov 14 2006**

Personal note to our Members
To give OPFMA members the opportunity to ask questions, share a technical solution or some great news about their organization that could be inspiring to their colleagues across Ohio - we'd like to create a special page in newsletter called "**Members' Word**"! Let us know what issues you'd like us to write about – what are your needs?
For any assistance in matters of interest to you just contact our office -You can count on swift answer!
Thank you for your patronage!

Reduce Duct Leakage and Save Money.

By Professor and BOC Instructor Richard Wirtz

Field studies, which have been made in every part of the country, show that duct leakage has an adverse effect on the efficiency of an HVAC system and the associated building envelope. This loss of efficiency increases the amount of energy that is required to operate the HVAC system, increases the demand load on the utility service and increases the cost of heating and cooling.

Duct leakage increases the equipment run time and the blower operating hours. This in turn exacerbates the infiltration problem because building envelope leakage is much larger when the blower is operating.

More energy is required to heat, cool and dehumidify a building when duct leakage increases the load that is associated with the structure or the duct system. In some cases, the ambient air that is associated with this load enters through the cracks in the building envelope and in other cases it enters through the return side of a duct system that is located in an unconditioned space or an ancillary space – an attic, an open crawl space, an enclosed crawl space or a basement.

The size of the leakage-induced infiltration load (and the amount of energy that is wasted) also depends on the difference (temperature and the moisture) between the air that exfiltrates from the envelope or the supply duct, and the replacement air, which may come from the outdoors or an ancillary space. Please note that in the summer time, the temperature in an ancillary space such as an attic can be much warmer than the outdoor air.

The following examples show the magnitude of the loads that can be produced by 1,000 CFM of duct leakage.

In example 1 we will calculate the heating and cooling loads that are associated with **leaky supply ducts** that are located in an open crawl area. We will base these calculations on 1,000 CFM of supply side leakage (which will create a negative pressure in the building that will induce 1,000 CFM of envelope infiltration). We will make these calculations for a hot humid day when the condition of the supply air is 55º F and 60 grains of moisture and the outdoor air is 90º F with 90 grains of moisture. For the heating side, our conditions are 20º F outdoor air temperature and the supply air temperature is 105º F.

Sensible heat load = 1.08 x 1,000 x (90-55) = 37,800 Btu/h
Latent load = 0.68 x 1,000 x (90-60) = 20,400 Btu/h
Total cooling load = 58,200 Btu/h
Total heating load = 1.08 x 1,000 x (105-20) = 91,800 Btu/h

In example two calculate the heating and cooling loads that are associated with **leaky return ducts** that are located in an open crawl area. We will base these calculations on 1,000 CFM of return side leakage (which will create a positive pressure in the building that will induce 1,000 CFM of envelope exfiltration). We will make these calculations for a hot humid day when the condition of the return air is 75º F and 65 grains of moisture and the condition of the outdoor air is 90º F with 90 grains of moisture. For the heating side, our conditions are 70º F return air temperature and outdoor air temperature is 20º F.

Sensible heat load = 1.08 x 1,000 x (90-75) = 16,200 Btu/h
Latent load = 0.68 x 1,000 x (90-65) = 17,000 Btu/h
Total cooling load = 33,200 Btu/h
Total heating load = 1.08 x 1,000 x (70-20) = 54,000 Btu/h

Duct leakage can affect the efficiency of the heating and cooling machinery, the efficiency of the building envelope and the combined efficiency of all the systems that are associated with a building. Duct leakage also affects the operating cost and the demand load - Reduce your duct leakage and save money!

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Building Operator Certification (BOC)

Building Operator Certification is a professional certification program for staff that operates and maintains commercial and public buildings.

Operators earn certification by attending training sessions and completing project assignments in their facilities. The certification provides a credential for their professional development while also offering employers a way to identify skilled staff.

The Ohio Department of Development has obtained a license for implementation of the BOC program in Ohio. OPFMA is a 501(c)(3) nonprofit educational association that organizes the BOC series across Ohio. OPFMA contracts and coordinates the BOC Instructors, the BOC students and class logistics, as well as the administrative and financial affairs related with the BOC program across the state.

The BOC program certifies individuals in energy and resource efficient operation of building systems at two levels:

Level I - Building System Maintenance

Level II - Equipment Troubleshooting and Maintenance

Participants attend eight days BOC classes, one day per month, and upon a successful completion of each class' test and in-facility projects, they receive the Building Operator Certificate from Midwest Energy Efficiency Alliance (MEEA) – Chicago, Illinois.

The BOC Program gets lots of attention among those who provides us with safety and wonderful living conditions in the public facilities. The program has been successful at improving the comfort in public facilities as well as saving energy and money.

The Northwest Energy Efficiency Alliance found that over 65% of BOC certified operators are applying concepts learned in training and 26% undertake specific measures such as large energy conservation projects and IAQ improvements. They also estimate that there is an average annual energy savings of 28,600 kWh per participant.

2006 BOC Series Started on Jan 27 2006 in Columbus!

As planned, the 2006 BOC series started on Jan 27th with a class of **35 BOC students - Ohio's largest one series enrollment ever!**

We are in the process of finalizing the logistics for the next BOC class. The registration form will be posted on our web site shortly

Some of the BOC prospects inquired about the process that leads to start a BOC class. Here are some of "behind the scenes" actions done before starting the registration:
Search market demand across Ohio, select the area with the highest demand, plan the entire BOC series, schedule instructors and BOC site coordinators, search and assure facilities for the entire BOC series, order students manuals, ensure instructors have the latest teaching material, etc.

The next BOC Series tentative starting date is **May 5th 2006**.

- We are in process of finding a proper and affordable training facility in Columbus
- Classes will be held one day per month – in the traditional form

We plan to have as BOC Site-Coordinator our highly professional and considerate, Mrs. Lori Killian, currently assisting the BOC Columbus Series which started on Jan 27th.

Important:

Columbus – a central location for Ohioans!
We encourage those who prefer Columbus area rather than Cleveland or Cincinnati to **take advantage** and register as soon as possible as seats are limited! The "**first come – first served"** principle is applied! So hurry - reserve your seat!

Contact our BOC Program Coordinator- Cornel Pod:
440.756.5620 or E-mail **bocc@opfma.org**

Check often our website at: **www.opfma.org** for new BOC classes to be offered in your area!

Maintaining an Efficient Boiler System

By Richard Greenwald – Greenwald Enterprises LLC – Beachwood Ohio

One of the most important jobs that a maintenance man has is to properly maintain a boiler system. The boilers in any building, if properly maintained, will help reduce costs of operation and increase the operating life of the boiler. We have listed a few tips that most properly-trained maintenance men already utilize every day.

Combustion Efficiency

The level of efficiency in a boiler is directly related to how many BTU's are wasted by being exhausted from the equipment to atmosphere during burner operation. Your existing boiler(s) may have been rated as high as 80% when it was new, but due to normal wear and tear, and other conditions, we would estimate an operating efficiency of 70% combustion efficiency to be typical. In the most basic of considerations this is a minimum 10% wasted fuel savings. (Other efficiencies will be discussed later.)

Combustion efficiency is optimal when the fuel to air ratio is tuned to its optimal settings as described in your equipment manual. Clean burners and heat exchanger surfaces are also an important and easy way to maintain optimal efficiency of the boiler. This should be done on a yearly basis.

The gas pressure after the regulator must be within the manufacturer's specifications, or the flame may be too lean, or rich. If the air to gas mixture is too lean, you will get less heat out of the boiler. Too rich and you could carbon the entire fire-side of the boiler. Carbon is not only an indicator of a combustion problem, but also an insulator. The more carbon is present, the less efficient the boiler.

Combustion Air:

Most boiler rooms suffer from a lack of air that is needed for a flame to burn effectively, therefore having a direct effect on boiler efficiency. There are 2 prevalent reasons for these situations. Either the original installation was improper, or most likely, someone modified the air opening. Some examples of this modification are cardboard, sheet metal, plastic, or plywood covering the openings. In some cases the owner wanted to be esthetic and installed glass block in place of an outside air louver.

The by-products of combustion are carbon monoxide (CO), nitrogen oxide (NO), and large amounts of water (H2O).

When combustion air is insufficient, the by-products of combustion tend to linger in the boiler burner chamber. Depending on the severity of insufficiency, there are many scenarios that can follow:

* The boiler chamber begins to overheat, causing steel to buckle, refractory insulation to crack, soot to form on the heat exchanger, warping of heat exchangers, hot spots causing mineral deposits to collect on the water-side of tubes. All the above exacerbates the effects, which snowballs into even more problems, until the boiler literally catches on fire.
* When more than 1 boiler is involved, it is sometimes possible that 1 boiler may actually draw the flue gases down the chimney of another boiler. The net effect is that carbon monoxide will be drawn into the room; acidic water vapor will begin to destroy the metal jacket and heat exchanger of the drawing boiler.
* The burners may end up falling out of the boiler due to deteriorated burner racks. If the boiler is on while the burners fall, a fire and explosion may ensue.
* There are several buildings where the boiler room is attached to a building garage that utilizes an exhaust system. In this type of situation, if the boiler room door is left open, or is not sealed properly, flames will be sucked out of the heating device, and burn up the controls and possible start a fire.

Carbon monoxide is poisonous, and it doesn't take much accumulation to cause a person to pass out and die.

There are a few simple and inexpensive solutions to resolving a combustion air deficiency. Since the "personality" of each building is unique, we believe an engineering perspective must be utilized to determine the proper solution. Each equipment manufacturer specifies the minimum amount of air needed for their equipment. The total amount of air needed for each piece of equipment must be added up, and then a louver, duct, or mechanical means of introducing air must be provided.

One may refer to the State of Ohio, National Fuel Gas Code, or call your local municipal building department.

Insulation Losses
Many piping systems have been utilized as coat hangers, work platforms, or storage areas. Other pipes have been subject to leaks from other sources such as waste pipes, roof leaks, or physical damage in high traffic areas. Where large amounts of insulation are missing from a piping system, the effect can be much greater. Some areas of piping may then become more vulnerable to freezing.

The insulation that has fallen off should be replaced after the cause has been eliminated. Insulation is inexpensive and easy to install. Though small areas of damaged insulation have a minimal effect on energy efficiency, over time these losses could add up to a considerable sum.

Water Leaks:
Water leaks can be very expensive. In boiler system, whenever water leaks out of the system it must be replaced by fresh water. This fresh water is colder than the heated water, and will take a certain amount more gas to heat it up to current heat levels. Aside from the obvious, fresh water also introduces into the system extra mineral deposits and oxygen.

Hot Water Systems:
Accumulated minerals, over time, create mud which reduces efficiency. It tends to circulate in the water and settling in low velocity areas such as cast iron boiler sections, piping low points, etc. This mud wears out pumps and piping, plugs heating coils, vents and fin tube radiation.
The oxygen in water pits the interior of piping and the boiler, reducing the effective life of the entire system.

A visual inspection by the maintenance staff is usually adequate to spot leaks, corroded fittings, insulation wet spots. All leaks need to be addressed. If a system is suspected of leakage, and the location is not readily evident, a water meter should be installed on the water feed line to record weekly usage.

Normally, in a closed-loop hydronic system the water does not need “blowing down” often. If the low water cut-off or bottom drain valve indicates a heavy concentration of mud, steps should be considered to drain and flush the system.

The low water cut-offs need to be cleaned, tested, inspected annually. The test is a simple procedure; while the boiler is operating the boiler water level is reduced by draining the boiler below the float or probe, simulating a low water condition. To properly test, a bottom drain needs to be utilized. Copper tube boilers usually have flow switches. To test this device, slowly close a main valve. The burners should shut down.

To be continued in another edition – You can contact the author at: (216) 401-1848 or e-mail: rich@greenwald.com

On the light side ...

The only thing I can’t stand is discomfort.

Father, each of your sermons is better than the next.

It matter not whether you win or lose; what matters is whether I win or lose.

It’s all right to have butterflies in your stomach. Just get them to fly in formation!

Advice is what we ask for when we already know the answer but wish we didn’t.

My computer is so fast! Before yours can boot up, mine has already crashed three times.

Never keep up with the Joneses. Drag them down to your level. It’s cheaper!

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All photos must be in JPEG or TIFF format and sent as an attachment to an email.

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