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## News from the Academic Facilities Council of IFMA

### A Message from the President:

Happy New Year! I hope the new year find you well. This issue of the newsletter contains an article on archive preservation, HVAC and sustainability. We hope you will find it of interest. If you happen to come across an article that could be of benefit to our members, please pass it along to us for possible reprint in the newsletter.

Also in the newsletter is the registration material and agenda for our Spring 2009 Conference at Carnegie Mellon University in Pittsburgh, PA. With the leadership of our host, Joseph Pastorik, the meetings and facility tours look to be most interesting. To keep costs down, the conference registration and tours will be at no cost. We hope you can attend. June 10 - 12, 2009.

Lastly, please take not of the upcoming webinars. This is a new venture for us and we expect to make it a regular offering through the Council.



*Steve Showers, CFM  
 Council President*

**In this issue:**

President's Message	1
Preserve History With the Right HVAC System	2
Spring 09 Information	5
Member Spotlight	6
Welcome New Members	6
2009 Webinar Schedule	7
AFC Online Community	8



## Preserve History with the Right HVAC System

Shehwar Haque, P. Eng.

Heating, ventilation and air conditioning (HVAC) systems for archival room storage typically aren't sustainable. Past designers of these critical environments have been more concerned with maintaining guaranteed temperature, humidity, air purification and air conditioning to preserve room contents rather than saving energy.

However a recent retrofit of the Western Hemisphere's most in-depth papyrus writings archival room at the University of Michigan's Harlan Hatcher Library, Ann Arbor, Mich., proves that preservation and sustainability can be combined. This can't be accomplished with off-the-shelf HVAC equipment or standard archival room design. Both the equipment and the room must have custom engineering and equipment, as was the case at the University of Michigan.



*Photo: University of Michigan archives | Preserving the Western Hemisphere's largest papyrus collection is a monumental refrigeration retrofit engineering task at the University of Michigan's Harlan Hatcher Graduate Library, Ann Arbor, Mich. Shannon Zachary, head of library preservation at University of Michigan, specified very tight set point condition tolerances of 65 degrees Fahrenheit (1 degrees Fahrenheit  $\pm$ ) and 45 percent relative humidity (4 percent  $\pm$ ) to preserve the ancient papyrus writings.*

### The preservation of historic writing

The initial steps involve statistical data collection on what environmental conditions are required to preserve a papyrus collection consisting of writings on fragile papyrus reeds dating back to 1000 BC. Because of their fragility and susceptibility to premature degradation due to temperature, humidity and gaseous contaminants—either from outdoors or within the room itself—their longevity depends on precisely maintained environmental conditions.

Luckily for the project's success, Shannon Zachary—head of preservation at University Library, University of Michigan—is a renowned expert on papyrus paper. She was able to provide the design team with the latest statistical research design parameters for proper environmental conditions. Based on a paper from the Canadian Council of Archives' "Conservation Environment Guidelines for Libraries and Archives" by William Lull, Zachary established set point conditions of 65 degrees Fahrenheit (1 degrees Fahrenheit  $\pm$ ) and 45 percent relative humidity (4 degrees Fahrenheit  $\pm$ ).

In the precision air conditioning equipment industry today, these set points are typically obtained by redundant equipment that is oversized to guarantee temperature and humidity. Oversized equipment requires more energy than what is actually needed to maintain set points. Therefore, critical temperature and humidity conditions are guaranteed but the tradeoff is efficiency.

### Adding green to the equation

This is where Thomas Girard, manager of mechanical engineering in the University of Michigan Architecture, Engineering & Construction Department, contributed some innovative ideas for designing a green system that is considered state-of-the-art in the world of archival and artifact preservation rooms today. Girard spearheaded the design of the custom manufactured equipment specified in the 30-year-old rooms HVAC retrofit. The team spent nearly a year mulling over enthalpy charts, temperature/humidity calculations and custom equipment manufacturing capabilities to arrive at a green system for this unique application.

*Photo: Joe Arnold, Computer Environments, Livonia, Mich., and Dectron Internationale, Roswell, Ga. | Instead of a more conventional outdoor location where Michigan's ambient air temperatures have wild swings of -10 degrees Fahrenheit to 95 degrees Fahrenheit, University of Michigan engineer, Thomas Girard located the two air-cooled condenser coils in the library's central HVAC penthouse mechanical room. The penthouse essentially is a flow-through relief exhaust plenum for the building. Thus the precision air conditioning system for the papyrus room operates more efficiently with its condensers subjected to the penthouse's more constant temperature fluctuation of 65 degrees Fahrenheit to 85 degrees Fahrenheit year-round.*



### Finding the right compressor

Perhaps the biggest energy saver is sizing the equipment properly for the room's unusual schedule—unoccupied 95 percent of the time and occupied with an impromptu class the remaining 5 percent. Girard felt it didn't make sense to operate a larger oversized system at 50-percent load with short cycling during unoccupied periods. Oversized compressors that start-up two to three times an hour waste energy versus efficient and exact-sized compressors that run 24/7. Instead of over-sizing a one-compressor system to handle the room at full load, Girard specified a dual 1.5-ton parallel airflow compressor/condenser system that saves 50 percent of energy versus typical archival room systems. This compressor is half of the dual system, which is sized exactly for the unoccupied needs of the room. To accommodate the heat loss of the room's door opening for class access, the lighting turned on and student body heat, a second compressor/condenser system activates to handle the extra cooling load. This compressor also fulfills the redundancy requirement in the event that the first compressor/condenser system fails and needs servicing.

Additionally, in unoccupied mode, the air flowing through the inactive coil essentially serves as free reheat. Less cooling is required since only half of the air is sub-cooled for dehumidification purposes. Dehumidification is accomplished by passing room air through a cooler coil which condenses the moisture. Virtually no additional reheat is required because the capacity of each compressor is closely matched to the continuous cooling load associated with fan heat.

Girard also used heat recovery to save energy and guarantee tighter temperature tolerances. Instead of a more conventional outdoor location where Michigan's ambient air temperatures swings from -10 degrees Fahrenheit to 95 degrees Fahrenheit, Girard located the two mandatory air-cooled condenser coils in the library building's central HVAC penthouse mechanical room—conveniently located on a floor above the eighth-floor papyrus room's 100-square-foot mechanical room. This mechanical penthouse shelters general building air handlers and also serves as return exhaust plenum. Thus the two condensers are subjected to a relatively constant temperature of 65 degrees Fahrenheit to 85 degrees Fahrenheit year round because the penthouse acts as a flow-through relief exhaust plenum.

### An environmentally-friendly refrigerant

Another green factor in the papyrus room HVAC equipment design is the choice of an environmentally-friendly HFC (hydrofluorocarbon) refrigerant R-407c for the air conditioning's refrigeration circuit. Most existing archival equipment uses the HCFC (hydrochlorofluoro carbon) refrigerant, R-22, which is an interim product used to bridge the gap between banned ozone-depleting chlorine-based CFC (chlorofluorocarbon) refrigerants and environmentally-friendly HFC refrigerants. R-22 is scheduled to phase out within the next few years.

While Girard's design uses many innovative green principles, there isn't ready-made equipment available on the market today that would satisfy his strict specifications. Therefore, custom manufacturing of the equipment was key as well on the retrofit project.

### Additional energy efficient options

While the papyrus room is virtually a new retrofit, there are additional methodologies that have recently become economical that manufacturers can now build into custom precision air conditioning equipment. Soaring energy prices have put many custom HVAC equipment manufacturers in a more efficiency mode. Institutions with critical environments are willing to pay the extra costs of this energy-efficient equipment, as the payback from energy savings has been shortened so drastically by rising energy costs.

- **Direct drive fans** – These offer two sustainability advantages: 1) Instead of conventional belt drives or blower configurations, a direct drive fan can allow for the addition of variable frequency drives (VFD), which ramp up and down in energy usage giving the application only the air volume needed to satisfy set points. 2) Direct drive fans consume less cabinet space, thus reducing the footprint of the HVAC system by nearly 35 percent. This results in a lighter unit that requires less shipping weight, less man-power to install and less valuable floor space in a mechanical room.
- **Free cooling** – This offers reduced energy costs by up to 50 percent in northern climates. Since critical environment rooms are many times self-contained rooms with different temperature/humidity needs than the building surrounding them, they may need cooling in winter. Instead of operating energy-consuming refrigeration circuits, HVAC systems with free cooling options can use wintertime ambient outdoor air to cool a glycol loop that in turn cools the room.



*Photo: Joe Arnold, Computer Environments, Livonia, Mich., and Dectron Internationale, Roswell, Ga. | The original prefabricated room envelope that contains the papyrus collection, which consisted of metal skin walls with an excellent R-15 insulation value, was still in mint condition and didn't need updating during the indoor air quality retrofit.*

- **Dual cooling** – This is ideal with sites that have available chilled water loops, which can be tapped to chill a glycol circuit via a heat exchanger. The glycol loop provides primary cooling and the HVAC unit's refrigeration circuit, which requires far more energy to operate, activates only as a redundant backup. This also eliminates the expense of a second unit or two refrigeration circuits for redundancy.

- **Microprocessor control** – Today's HVAC systems are compatible with most building automation control (BAC) protocols. With monitoring and control from a BAC, HVAC systems have the ability to run more precisely and efficiently.

Luckily, the room itself did not need any retrofitting because it was heavily insulated and well-suited and originally built for critical environment use. The metal skin walls have an excellent R-15 insulation value.

The University of Michigan papyrus room collection's HVAC system is proof that if engineers put their mind to it, anything is possible—including the provision of a perfect temperature/humidity environment that preserves archives while using the least amount of energy. **FMJ**



*Photo: Joe Arnold, Computer Environments, Livonia, Mich., and Dectron Internationale, Roswell, Ga. | The ancient writings on fragile papyrus reeds, which date back to 1,000 B.C. and were found by university researchers during early 20th Century archeological digs, require a constant temperature and humidity that is supplied through Ecosaire by Dectron precision air conditioning.*

### About the author

Shehwar Haque, P.Eng., is manager of engineering and applied sales at IAQ equipment manufacturer, Dectron Internationale (Montreal, Canada) for the Ecosaire Precision Air Conditioning Systems. Haque is responsible for standard and custom product development and is currently combining precision air conditioning with high-sensible cooling, dehumidification, and gas phase filtration for turn-key solutions in critical environment applications. Haque is also a member of ASHRAE. For more information go to [www.ecosaire.com](http://www.ecosaire.com).

This article can be found on, [http://www.ifma.org/ifmanet/fmj/2008/jul\\_aug/10g.cfm](http://www.ifma.org/ifmanet/fmj/2008/jul_aug/10g.cfm).

### High IAQ for Papyrus Writings and Humans

The University of Michigan's papyrus room collection has an invisible guard against poor indoor air quality that can prematurely degrade the ancient writings on fragile papyrus reeds. A gas phase charcoal filtration module is in the precision air conditioning units and processes return air from the room as well as outdoor air. Unlike more conventional filters designed for airborne particulates such as HEPA, gas phase is a custom manufactured carbon-based media in the form of pellets. Any air that has airborne contaminants, such as off-gassing from construction materials, outdoor vehicle emissions or chemicals emitted from degrading artifacts, is absorbed into this carbon media as it passes through the air conditioning unit. Gas phase is better known in industries such as paper/pulp, petrochemical and water waste management—where these chemicals are absorbed into carbon media pellets to protect industrial control room electronic equipment humans that work or live near the environment.

In addition to gas phase filtration, the papyrus room system also employs a 30 percent pleated filter and 95 percent pleated filter for particulates, as well as a post gas-phase pleated filter to catch any charcoal dust.



**Upcoming Events—Save the Date:**

**Academic Facilities Spring Conference 2009**

**Carnegie Mellon University**

**Pittsburgh, Pa.**

**June 10—12, 2009**



**Register today! FREE to AFC Members!**

Fax registration forms to **(281) 974-5690**

**Lodging-** Available at the Courtyard by Marriott, Shadyside/Oakland, 5308 Liberty Avenue, Pittsburgh, PA 15224.

\$159 room rate a night (Special room rates are available from June 6 – June 12, 2009)

Call 1-800-321-2211 to make your reservation. Identify yourself as CMU- Academic Facilities Council. Group rate available until May 19, 2009.

**Conference Agenda:**

**Wednesday June 10, 2009**      **AFC Welcome**

- 8:00 a.m. – 3:00pm      Steel Mill Tour - Tentative
- 6:30 p.m.              Hotel lobby: Bus pick up for dinner
- 7:00 p.m.              AFC President's Invitational Dinner  
Georgetown Inn, Grandview Avenue

**Thursday June 11, 2009**      **Conference**

- 7:45 a.m.              Hotel lobby: Bus pickup for campus
- 8:00 a.m.              Breakfast, Carnegie Mellon University
- 8:45 a.m.              Campus Tour
- 12:30                  Lunch
- 1:30 p.m.              Overview: Campus Masterplan
- 3:00 p.m.              [Business Meeting] on Campus
- 5:30 p.m.              Free Time
- 6:30 p.m.              Hotel lobby: Bus pick up for dinner cruise
- 7:00pm – 10 pm      [Gateway Clipper Fleet](#)

**Friday June 12, 2009**      **Optional Tours**

- 7:30 a.m. – 8:00 a.m.      Breakfast at hotel
- 8:00 a.m. – noon        Hotel lobby: Bus will pick up for [Phipps Conservatory Tour](#) (20 each) or [Cultural District Tour](#) (20 each)

**About the Academic Facilities Council:** Academic facilities offer facility managers and space planners many unique challenges. These individuals must effectively plan, design, construct, utilize and maintain a variety of buildings, grounds and equipment including classrooms, computer labs, residence halls and apartments, athletic facilities, dining halls, theaters, laboratories, libraries and health care facilities. The students, instructors and researchers who utilize these facilities have needs that may radically differ from conventional building tenants.



## Membership Spotlight—GEORGE THOMLISON

George Thomlison, Manager Human Resources & Procurement, University of Alberta  
Academic Facilities Council Secretary

George has over 35 years in the Facility Management field, the first 15 years operating a variety of city recreation & service facilities. The last 20 involved with providing cleaning & grounds services to university facilities. In his current position he acts as a consultant across the Division in two major areas human resources, which includes all aspects of training, health & safety, hiring, union issues etc.

His second area of responsibility is purchasing and contract management. In this role, he is responsible for testing and purchasing of cleaning supplies & products as well as managing a variety of service contracts, waste & recycling, pest control, exterior window cleaning and custodial services.

This combination of responsibilities has made it easier to affect change within the Division as he is ultimately responsible for the purchase of cleaning chemicals and equipment, and responsible to ensure that staff are trained correctly.

### **What is the most memorable moment from any AFC gathering?**

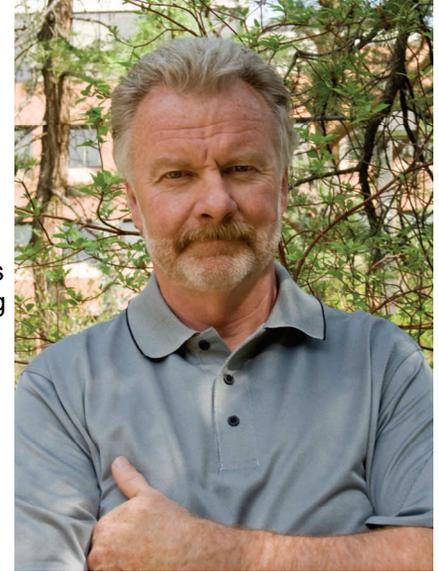
Hosting the AFC Spring workshop 08 at the UofA or drinking beer on Bourbon Street with Bill O'Neill and Curt (from the home of the Golden Gophers)

### **What value do you think the council provides to its members?**

The key to getting something out of the AFC is to become involved .....whether it's posting or answering questions on the web-site, participating in a webinar, attending the spring and fall workshops, or providing items for the newsletter. The AFC is really trying to provide a valuable service to the members, in order for that to happen we need the members to be engaged. I think the AFC provides its members with a vast resource of information that you just need to get involved to access.

### **What is one aspect of your personal life that you'd like people to know about?**

Away from the office I pursue a variety of activities to keep my head straight I climb icefalls in the winter and mountains in the summer, I golf and still play Old Boy Rugby.



## Welcome New AFC Members Section—November and December 2008

Linda Richard CFM General Manager ARAMARK Higher Education	Eric Estes CFM Facility Manager, CFM Northern Illinois University, Naperville	Craig Schick President & COO Southwest Development Group	Trine Aschim Manager New York University
Robert Morgenstern New York University	Thomas Tiernon Facility Director Taylor University FT. Wayne	Michelle Perry Area Manager Haworth	Ramadurai Shankar CFM Vice President Projects and Facilities Manipal Universal Learning Private Ltd
Shauna Mallory-Hill Assistant Professor Faculty of Architecture, Uni- versity of Manitoba	Peter Arpin Manager of Grounds Moses Brown School	Rod Shaffert PE, LEED AP VP, Scholastic Division Cutler Associates, Inc.	Ralph O'Rear Director of Operations Buck Institute for Age Re- search
Cody Neuhold Facilities Manager Colorado Community Col- lege System	Tim White Acquisitions Leader - Pitts- burgh The Trane Company	David Umstot PE, CEM Vice Chancellor, Facilities Management San Diego Community Col- lege District	Cathy Vu CAFM Technologist University of Calgary



## Academic Facilities Council—Webinar Schedule for 2009

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The Academic Facilities Council will be offering webinars and roundtables throughout the year! Keep an eye out on email messages for free webinars and roundtables to share best practices, grow within the profession and receive CEU and CFM Maintenance Points!

### SAVE THE DATES—Upcoming Webinar and Roundtable Schedule

#### AFC Online Community Training & Roundtable Webinar

Wednesday, January 28, 2009

Time (12:00 p.m. Pacific / 1:00 p.m Mountain / 2:00 p.m. Central / 3:00 p.m. Eastern)

We have set up the next training session for you to learn and understand how to use the new platform <http://ifmacommunity.org/>. We'll give you a play by play of how to navigate through the Academic Facilities Council online community. Plus, get some quick and helpful tips! We will also be having a roundtable discussion after the training session. The AFC board thinks this would be an excellent opportunity to share issues, concerns and best practices with your fellow AFC members. Do you have any ideas for saving money at your facilities during this economic downturn? Any other topics on your mind? Feel free to bring them up!

Meeting Link: <http://ifma.acrobat.com/r64413004/>

Conference Number: 1-800-819-4921

#### AFC Presents: A Generation Y Perspective Webinar

Tuesday, March 3, 2009

Time: (10:00 a.m. Pacific / 11:00 a.m Mountain / 12:00 p.m. Central / 1:00 Eastern)

Time allotted: 90 minutes

Email [jeannie.nguyen@ifma.org](mailto:jeannie.nguyen@ifma.org) to RSVP for login instructions with dial in number and meeting link.

This webinar has been submitted for CEU and CFM Maintenance Points

#### AFC Presents: A Range of Inspection Webinar

Wednesday, April 15, 2009

Time (11:00 a.m. / Pacific / 12:00 p.m. Mountain / 1:00 p.m. Central / 2:00 p.m Eastern)

Time allotted: 60 minutes

Email [jeannie.nguyen@ifma.org](mailto:jeannie.nguyen@ifma.org) to RSVP for login instructions with dial in number and meeting link.

This webinar has been submitted for CEU and CFM Maintenance Points



### Share Your Story!

Have you come across an interesting article, written one or have a specific topic to hear more about?

If you'd like to share this information with your fellow AFC members, please contact Jeannie Nguyen, Council Liaison at [jeannie.nguyen@ifma.org](mailto:jeannie.nguyen@ifma.org).

The AFC is looking for possible topics for online webinars, content for the newsletter and website.

## TIPS FOR NAVIGATING:

After your first login, you must subscribe yourself to the council postings to activate email deliverability to all council postings, similar to the listserv. You are not automatically subscribed to email delivery.

1. **Log in** to <http://www.ifmacommunity.org>

(You must use your IFMA member ID and IFMA password)

2. **Click on Forums** on the top left menu tab

3. **Click on Forum Subscriptions** (located on the left hand side of the page, under Shortcuts)

4. You can then change the default setting from not receiving subscriptions to receive postings via email. **Click under the Subscription to "YES"**(to receive postings by email similar to the listserv) **or "NO"** (which means you will need to login to the IFMA Online Community to view the discussions) The subscription's default setting is "NO" in order to change it to "YES" simply click on the "NO".



## TIPS FOR POSTING & REPLYING TO QUESTIONS:

1. To **reply** to emails that you receive, you can post your responses (just like the listserv).

2. If you would like to **post a new message/question** to the Academic Facilities Council Online Community without having to login to IFMA Online Community, just send your email to this email address for your specific council, [afc.council@ifmacommunity.org](mailto:afc.council@ifmacommunity.org). This will allow for you to post and reply by email, similar to the listserv tool we were using.

### **Academic Facilities Council Web site**

Click here: <http://www.ifma-afc.org/>

Check out the AFC Web site for the latest information on conferences, officer contacts and much more!