



## FREEZE UPS AND FROZEN PIPES

If your facilities is like most in New England, the winter months bring with them the specter of tripped air handlers, frozen coils and/or frozen sprinklers and pipes. Hardly is there a Facilities Engineer that hasn't faced repairing a frozen coil or pipe. Given the basic design and nature of air handling units with outside air economizers, this is the first place we experience cold weather failures.

During the winter months, air stratification results in a variety of problems. Perhaps the most widely recognized problems are frozen coils and low temperature limit controller (freesstat) trips. In many cases, air handling units are unable to operate when the outside air temperature falls below 25-30° Fahrenheit. Unfortunately, the solution to this problem has often been to close outside air dampers. Other problems associated with winter stratification are poor mixed air temperature control, and excessive energy use due to heating and cooling the mixed air.

Many solutions have been proposed for stratification found in HVAC systems. For winter stratification, designers often use some type of antifreeze solution to prevent frozen coils. While this solution does prevent frozen coils, it does not address the problem of control inaccuracies, coil inefficiencies, or poor outside air distribution throughout the return air stream. In addition, glycol additives serve to increase pump horsepower and decrease heating/cooling capacity. Today there are many after-market tools available to help us ensure effective mixing of outside air with return air. Although these really do help, nothing eliminates freeze dangers better than good maintenance and preparation.

Frozen sprinklers and general water piping, in both large and small sites, is ever-present. Hardly a site escapes the winter months without a freeze up. Beyond the water damage and loss of business related to these incidents, the cost in terms of emergency repair labor can be overwhelming. Needless to say, the last thing you want to play with during sub zero weather is wet piping.

Although we can never fully protect ourselves from freeze ups, there are a few precautionary maintenance items that will help avoid major problems. A full fall check up on all air handlers, damper systems and piping is your best protection. Check all operators, damper gaskets and mixing boxes. Never shut down an air handler during freezing weather. The natural negative environment within the building will only serve to draw sub-zero air through leaking economizers and freeze contained, inoperative coils. Although freesstats are placed to protect coils from freezing, if unchecked these devices create a serious exposure to freezing by infiltrating air. If you have these devices, consider supervisory alarms to alert you to a possible problem before damage occurs.

Drain all potentially exposed pipes. Those in constant use should be examined to ensure they are not exposed to outside air infiltration. Many frozen pipes have been experienced in "wet walls" located in the center of well heated spaces. Most times, insulation from un-tempered air was either overlooked or not installed. Modern raceways for pipes, data cables and entertainment systems become conduits during sub-zero weather conditions. Remember, where there's air movement, there is the potential for a freeze up.



### I'll bet you didn't know that...

- Months that begin with a Sunday will always have a "Friday the 13<sup>th</sup>."
- The Eisenhower Interstate highway system required that 1 mile in every 5 must be straight. These straight sections are usable as landing strips in time of war or other emergencies.
- If you put a raisin in a glass of champagne, it will keep floating to the top and sinking.
- Actor Tommy Lee Jones and V.P. Al Gore were freshman roommates at HARVARD.
- 35% of all people who use personal ads or dating services are already married.
- The average life span of a major league baseball is 7 pitches before it's replaced.
- The electric chair was invented by a dentist... (bet you already guessed that one!)
- The cigarette lighter was invented well before the match.
- All the clocks in the movie "Pulp Fiction" are stuck at 4:20
- Women blink nearly twice as many times as men do.
- You have a 1 in 2 billion chance of living to 116 years of age.



## TERROR RESISTANT IAQ

Penn State Engineers have developed a terror resistant air conditioning concept that they estimate costs less to install in new construction, is more energy efficient, and is cheaper to operate than the current standard systems.

If an anthrax laden letter is opened in a typically designed building, it will be carried to other locations within the building. Additionally, forced air systems can expose occupants throughout the building to disagreeable odors, cold viruses and/or contribute to sick building syndrome.

By de-coupling the HVAC process, the new system is cheaper, easier to operate and provides for better cooling. The new approach is called "Dedicated Outdoor Air Systems" (DOAS). It couples independent fresh air supplies with radiant cooling panels. Since the DOAS does not use re-circulated air, it does not circulate noxious agents released inside to other areas of the building. In conventional systems over 80% of air is carried over as re-circulated air.

A prototype system is presently in operation at Penn State. This highly successful test uses tempered fresh air entering at the ceiling, radiant cooling panels on the walls, and traditional perimeter radiators to provide heat. Researchers estimate that this type construction saves \$2 per square foot during construction with operating costs at 60 to 70% that of standard HVAC systems.



## Riddle me this... and WIN dinner for 2

Just solve the following riddle.

Two legs I have, and this will confound: only at rest do they touch the ground! What am I?

e-mail or FAX your answer to our office.

If more than one correct entry is received, a winner will be selected at random.

The answer to the "PUZZLE" from last time was "Happy New Year" We received 13 correct responses.

- |                                  |                                            |
|----------------------------------|--------------------------------------------|
| D. Baker - Hines                 | K. Balun - MannKind BioPharmaceuticals     |
| T. Orzech - Nestle               | R. Chamberland - Cytec Industries          |
| N. Carney - Morganti             | B. Sapienza - Sapienza & Lessig Architects |
| G. Timura - Downes Group         | M. Tanguay - 777 Pipefitters Union         |
| A. DiVincis - Garcia & Milas     | A. Sanders - Hoffmann Architects           |
| E. Belardinelli - Bethel Schools | B. Swanson - C.B. Swanson Architects       |
| J. Moffet - R2D Construction     |                                            |

A final winner will be selected at random.

## What's Goin' On?

- Jan 26<sup>th</sup> - Jan 28<sup>th</sup> 2004 AHR International Show, Anaheim CA International AC, Heating and Refrigeration Exposition
- Jan 29<sup>th</sup> Central CT Regional Construction Forecast The Construction Institute, Cromwell, CT
- Feb 7<sup>th</sup> - Feb 11<sup>th</sup> 2004 CTI Annual Conference, Houston, TX Cooling Technology Institute
- Feb 25<sup>th</sup> - Feb 28<sup>th</sup> ACCA Conference and Expo, New Orleans, LA Air Conditioning Contractors of America
- Mar 30<sup>th</sup> Construction Institute Connecticut EXPO Radisson Hotel, Cromwell, CT
- Apr 9<sup>th</sup> - Apr 18<sup>th</sup> New York International Auto Show Jacob Javits Convention Center, New York, NY



## WHERE DID Valentine's Day COME FROM

Under the rule of Emperor Claudius II, Rome was involved in many bloody and unpopular campaigns. Claudius "The Cruel" was having a difficult time getting soldiers to join his military leagues. He believed the reason was that Roman men did not want to leave their loved ones or families. As a result, Claudius outlawed all Roman engagements and marriages. Saint Valentine was a priest at Rome in the days of Claudius II. He aided lovelorn couples by secretly performing marriage ceremonies for them. Soon Saint Valentine was apprehended for this kind deed and dragged before the Prefect of Rome. He was condemned and ultimately beaten to death with clubs, becoming a martyr on February 14<sup>th</sup> in the year 270.

The best way to forget your problems is to help solve someone else's

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