Break/Exercise #1

Given:

- Foggy with forecast 50°F temperatures until mid-afternoon
- Ball Room is at 72°F
- Minimum outdoor air percentage recently verified as 25%
- Fan discharge temperature at 51.1°F
- Puddle of condensate at the drain line
- Return air at the unit is 73.4°F
- Outdoor air at the unit is 52.2°F
- The tools in the following slides

Answer the Following Questions

1. What is the current mixed air temperature?

   _____

2. Does the current mixed air temperature increase or decrease the cooling coil load relative to the load in the ball room?

   ☐ Increase ☐ Decrease ☐ No impact

3. Will the mixed air condition impact the cooling coil load relative to the load in the ballroom the same way as it does currently for the entire year?

   ☐ Yes ☐ No

ALTITUDE: 423 FEET
BAROMETRIC PRESSURE: 29.467 in. HG
ATMOSPHERIC PRESSURE: 14.473 psia

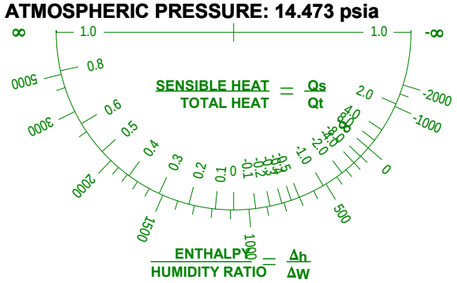

Chart by: AKTON PSYCHROMETRICS, www.aktonassoc.com

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Steady Flow Energy Equation (aka Conservation of Mass and Energy

$$Q + u_1 + \frac{p_1 v_1}{J} + \frac{z_1}{J} + \frac{V_1^2}{2gJ} = \frac{W}{J} + u_2 + \frac{p_2 v_2}{J} + \frac{z_2}{J} + \frac{V_2^2}{2gJ}$$

Where:

Q = Heat in Btu/lb

W = Shaft work, ft-lb/lb

u = Internal energy, Btu/lb

pv = Flow work; pressure in lb/ft^2 x specific volume in ft^3/lb, ft-lb/lb

J = Mechanical equivalent of heat; 778 ft-lb/Btu

V = Velocity in feet per second

g = gravitational constant, 32 ft/sec/sec

The quantity $u_1 + \frac{pv}{J}$ shows up frequently in thermodynamics and is termed "Enthalpy" and given the symbol "h".

Thus, the equation above can be written as:

$$Q + h_1 + \frac{z_1}{J} + \frac{V_1^2}{2gJ} = \frac{W}{J} + h_2 + \frac{z_2}{J} + \frac{V_2^2}{2gJ}$$