ASHRAE Ottawa Valley Chapter

Chapter Meeting #2 – 17 October 2017

Meeting Date:	17 October 2017					
Location:	Centurion Conference & Event Center, 170 Colonnade Road South					
Attendance:	Total:	56				
	Members:	42	Guests:	8	Students:	6
Theme:	Student					
Tour:	None					
Tech Session:	None					
Table Top:	Hydro Ottawa and Belimo					
Program:	Electrical Fundamentals for HVAC or How to speak Electrical and not lose your cool?					
Speakers:	Jeff Siddal, LEL, CET					
Prepared by:	Aaron Dobson					

Social (17:30 – 18:26)

Business Session (18:26 –19:34)

- President-Elect Dan Redmond welcome message, call to order.
- President-Elect Dan Redmond introduced the Board of Governors and the Executive.
- Secretary Aaron Dobson introduced the guests.
- Membership Promotion Chair Celine Baribeau introduced the 6 new members to the Ottawa chapter.
- This month's theme is Students. Student Activity Chair Peter Shaw-Wood welcomed 6 students in attendance. Talked about Algonquin and Ottawa U chapters and recent event at Queen's University.
- President-Elect Dan Redmond talked about research promotion. He mentioned that Past-President Abbey Saunders is selling raffle tickets for (2) club seat tickets to a Red Blacks game.
- Table Top Displays – Noah Goddard from Hydro Ottawa talked about incentive program with Hydro Ottawa funding commercial customer energy efficiency projects. Clark Campbell from Belimo talked about new products available through Belimo such as CO2 sensors, temperature and pressure sensors, all are Nema 4 rated with standard Belimo orange color. New actuators for butterfly valves up to 12" valves are electronic fail safe, BACnet and modulating.
- President-Elect Dan Redmond welcomed Paul Pieper to give a talk about ASHRAE Technical Committees the Who, What, and How
    - ASHRAE has 4 types of committees whose focus is primarily on technical information
        - Technical committees (TCs)
        - Task Groups (TGs)
        - Technical Resource Groups (TRGs)
        - Multidisciplinary Task Groups (MTGs)
    - Three types of members that are Volunteers

    - Voting
    - Corresponding (non-voting)
    - Provisional Corresponding (non-voting)
- Member represent diverse backgrounds
    - Manufactures, Consultants, Researchers, Universities, Utilities, Regulators, Contractors, Government
- How does an ASHRAE Technical Committee (TC) Work?
    - Org Chart showing various roles (Section Head, Chair, subcommittees, Officers, TC Members and Liaisons)
- ASHRAE Research – Initiated & Monitored
    - Identify needed research
    - Develop research work statements
    - Evaluate proposals
    - Monitor the research project
    - Ensure results are disseminated to the Society
    - E.g. the ASHRAE Design Guide for Dedicated Outdoor Air Systems was developed through research + a new Handbook Chapter
- Participate in the ASHRAE Standards Process
    - Primary responsibility for document development lies with Standards Project Committees (SPCs)
    - Recommend topics needing a standard
    - Regularly review the TC's standards
    - May be asked to be members of the SPC
    - Provide liaisons to SPCs
    - May be asked to provide concurrence with non-ASHRAE standards (e.g. ASTM or ISO)
- Handbook Chapters
    - Assigned chapters consistent with their expertise/scope
    - Most have standing handbook subcommittees to write and revise chapters and may be responsible for multiple chapters.
    - Responsibility for chapters is listed in the Handbook (as are major content contributors)
- Programs for ASHRAE conferences
    - The committees and their members suggest topics and sessions for presentation, thus almost all the conference programs are sponsored by the TCs, TGs, and TRGs.
    - Technical & Conference Paper Sessions (Symposia)
    - Paper sessions on specific topics that are published in ASHRAE Transactions usually initiated by TCs or TGs and reviewers are usually from TCs, TGs, or TRGs
    - **Seminars and Forums:**
    - Majority of these sessions are proposed, developed, and presented by committee members.
    - Seminar topics include basics, recent advances, and on-going research of members and their organizations.
    - Forums involve audience participation on questions posed by TCs to identify members' technical needs.
- How to get involved?

        - Go to the ASHRAE website to see which are most relevant to your interests and expertise (https://goo.gl/Kddk7P)
        - TC scopes available for all (https://goo.gl/3fgaiA)
        - TCs have websites (https://goo.gl/S4yX6N)
        - Document created for YEA Members: "How to Participate on TCs" (https://goo.gl/6Y1JHX)
        - Then choose a way to get involved
        - E-mail the secretary or chair about your interest (see TC website for specific email address)
        - Attend Society Winter and Annual meetings and the TC(s) you are interested in – volunteer!
        - Apply for provisional corresponding membership directly from the TC website(s) (https://goo.gl/jVHrEa)
    - Applying for membership on a Technical Committee
        - Apply for provisional corresponding membership directly from the TC website(s)
        - https://www.ashrae.org/standards-research--technology/technical-committees/applying-for-membership-on-a-technical-committee-2015
        - There is also usually a link under the membership heading from the TCs website
    - "Remote" Participation
        - Participation has historically been based upon attendance at the Winter and Summer Conferences
        - Committee members (Voting, Corresponding, Provisional Corresponding) get all minutes and other documents distributed by the committee.
        - Volunteer!
        - Remote Participation in Meetings (RPM) enable some committees to include members and others who are unable to be physically present
        - Webinar – can see info being shown
        - Happens at the time of the committee meeting
        - Not all committees do this – need to find out ahead and sign up
        - More common in sub-committee meetings, although ASHRAE is providing more tools to TCs to enable this in the future – stay tuned!
    - Volunteer
        - Become A Future Leader in ASHRAE – Write the Next Chapter in Your Career
        - ASHRAE members who participate in technical activities become leaders and bring information and resources back to their jobs and their chapters
        - YOU ARE NEEDED FOR:
            - Program ideas
            - Research ideas
            - Handbook ideas
            - Standards ideas
            - Student mentoring
- YEA Chair Joe Della Valle talked about the contest for members for YEA Leadership Weekend and LeaDRS Program. There were 5 participants for Leadership Weekend

and 2 for LeaDRS. Joe Della Valle talked about the upcoming ASHRAE YEA event on November 3rd at Archery Tag.

- President-Elect Dan Redmond called Abbey Saunders to draw (2) club-level Red Black tickets with parking pass to the October 27th game donated by Modern Niagara Ottawa Controls. The winner was Ryan Dickenson. $820 was raised for ASHRAE Research. A second draw was made for a carrying bag donated by Belimo. The winner was Evan Boucher.
- President-Elect Dan Redmond announced the program topic and invited Chris Frauley to introduce the guest Jeff Siddal. Chris Frauley talked about Jeff Siddal's work history and how the program topic came about.

Business Session Finished at 7:34pm

Dinner (18:45 – 21:07)

- Dinner served at 6:45pm
- Dinner was Garden Salad for starter. Roast beef with mash potatoes, carrots and beans for main and chocolate cake for dessert

Evening Program (19:34- 21:07)

- Evening program started at 7:34pm
- Jeff Siddal gave an overview of the presentation, with an objective to teach the language of electrical and what to do to survive and thrive in the "electrical jungle".
- Jeff Siddal mentioned that the presentation is not just sitting but interactive and asking for volunteers to participate.
- Reviewing mechanical drawings, schedules of motors, AHUs etc., but voltages were different then electrical drawings. What happens? Change orders!!
- Talk will be how to avoid change orders.
- "Guide to Travel through the electrical jungle" and electricity is about shifting energy.
- Speaking the Electrical Language – Volts & Amps
    - Volts are electrical pressure and amps is flow of electrons
    - Leave power factor to electrical guys – whole other presentation
- Speaking the Electrical Language – AC/DC or Electrical Interpretive Dance
    - Direct current – battery. Electrons travel one direction through the load.
    - Volunteer exercise – 8 people volunteered from crowd to make a DC circuit. Volunteers passing water around (as energy) from glasses to the jug (as the load). This exercise was to visualize how energy is delivered. The same exercise was done for an alternating current – AC.
- Speaking the Electrical Language – If one Phase is good three must be better
    - Talk about residential 120/240-volt waveform.
    - 240v is good to deliver low voltage.
    - 240V is not good for mechanical large motor loads, high current. Needs special starting features.
    - Another 1-person demonstration – AC requirement for capacitors to alter magnetic field.
    - Small motors need capacitors.
- Speaking the Electrical Language – How many voltages do you need?
    - 3 phase power in AC model. 3 loops separated by 120 degrees.
    - 3 phase power does cool stuff.

    - 120/208, 277/480, 347/600.
    - Creates rotating torque without special tool.
    - Demonstration to show this with 3 people. To demonstrated how the motor turns.
    - No starting capacitor required to turn.
    - 3 phase has large starting torque to get fans going.
- Speaking the Electrical Language – If one phase is good three must be better
    - Example of electrical grid showing generator producing 3 phase power to 3 phase loads.
- Electrical Jungle
    - Visual of "electrical jungle" aka electrical system
        - Switchboard (from utility) to panelboard, MCC, transformer to panelboard (480 to 120v)
        - Example from experience. 600-amp MCC (if already on site) cannot be retrofitted. You are buying a new one. It takes 12 weeks to get new MCC. Avoid buying a new MCC, delay claims, restocking of existing MCC by asking Mechanical what the amp requirements are.
        - Important to listen to electrical guy and give the requirements to degree of certainty.
        - Another example – Mechanical gave 275 amps as a requirement, the Electrical suggested a 300-amp MCC. The Electrical ended up putting in a 600-amp MCC (Customer has an electrical shutdown once every 2 years). In the end, the requirements came to 540 amps from Mechanical.
        - Mechanical can help avoid issues for electrical.
- Jungle Map or Single Line Diagram
    - Single Line Diagram = Road Map of Electrical System
    - Single line used to represent all the wires in the system
    - Volts, amps on drawings. Look at it and coordinated with Mechanical
- Electrical Jungle – Transformers or Change is good
    - Why? Change one voltage to another
    - It gives off heat, needs to be ventilated
    - Loses 2 to 3 percent of full rating of every hour every day transformer is on
    - Transformer is not a perfect machine
    - Higher voltage to eliminate number of transformers and reduce eliminate heat. Avoid spending energy to eliminate heat energy.
    - Tips of ventilating transformer. Ventilate next to parking garage. If you pull air from parking garage it will corrode transformer. Pull air from somewhere else and heat garage with air from transformer room.
    - Keep out rain, snow into transformer room.
- Jungle Utility Gods – They must be worshipped!
    - Guidelines for Hydro Vaults. Different utilities have different standards, but commonalities.
    - Utilities do not want people in their hydro vault.
    - Example of hydro vault layout
        - Layout of intake and exhaust to avoid sucking in snow and rain
    - Air flow rate requirement through vault from utility. Do not meet it they will not turn it on.
    - Do not air condition unless you have no choice. Transformers work fine up to 40

degC. Do not go beyond room temperature because you will have to de-rate equipment.
    - UPS will not work at 40degC, not happy beyond 25 degC.
    - Question from audience about humidity levels. Humidity is fine if it does not condense.
    - Filter the room intake. Put filter outside to service it. If filters are inside, you will need to call utility to unlock door to access filters. Utility gives one free open every 1-2 years.
    - If Room overheats from high temp alarm, utility will shut you down until fixed
- Finally the interesting stuff – Motor Starter
    - Device to start/stop motor, change direction of rotation
    - Big motor = big starter (500 hp motor, 500 hp starter)
    - Electrical industry has changed to where mechanical equipment comes with built in starters. Use to be separate, now mechanical specifies starters. Mechanical should consult with electrical partner to make things work better.
    - What do you need for controls? BAS, hand/off/auto, auxiliary contacts
    - Electrical will ask when part of mechanical package (MOP - maximum over current protection, MOC - maximum operating current (MOP bigger than MOC).
- Finally the interesting stuff – VFD
    - Makes all your problems go away
    - Bigger motor bigger the drive
    - Operating motor at less than 60% of full load speed for long time will overheat the motor
    - Who specs mechanical or electrical, in MCC or not. If in MCC, the electrical coordination is huge if another manufacturer is trying to put their VFD in another manufacturer's MCC
    - Mechanical considerations
        - VFDs give off heat
        - 100 hp running at 60hp will put out a lot of heat
- Finally the interesting stuff – MCC
    - Tested at factory prior coming to site
    - Easy and fast to install, works well
    - Prewire for BAS, fire alarm shutdowns
    - Electrical loves MCCs
- Finally the interesting stuff – Motor Coordination Lists
    - Specify starters and MCCs
    - Legend at bottom list the options. Aux contacts, h/o/a lights. Shopping list of features
    - Mech schedule is different than electrical.
- Finally the interesting stuff – motor starting
    - In rush energy to get motor turning
    - Soft starter (VFD acting as soft starter) = as low as 3 times in rush current
    - In rush current not a problem if connected to utility

- Finally the interesting stuff – Motor Loads on Generators
    - Generator is one internal combustion engine
    - The engine power available; Is the engine big enough?
    - Starting too large a motor on a generator and the voltage and frequency will dip

to the point that other loads will drop off. The generator may stall or be damaged.

- Emergency Power – to connect or not to connect
    - From CSA C282 Emergency Electrical Power Supply for Buildings. The following equipment shall be considered life safety
        - Fire alarm and emergency voice communications systems
        - Firefighters' elevators and elevators serving story's above the first story in a high building;
        - Fire protection water supply pumps that depend on electrical power supplied to the building;
        - Smoke control systems;
        - Fans required for smoke control;
        - Emergency lighting; and
        - Exit signs that depend on electrical power supplied to the building.
    - If generator is big enough, you can supply power to chiller, domestic booster pump if you have a separate transfer switch
- Emergency Power – A second transfer switch or when one is not enough
    - Priority loads get switched first. If domestic water booster pump is on generator it will require a second transfer switch
    - All sump pumps are considered asset protection, not emergency which will require second transfer switch
- Questions – eleven questions asked
- President-Elect Dan Redmond thanking speaker and presenting gift (commemorative coin) to Jeff Siddall from ASHRAE Ottawa Valley Chapter
- President-Elect Dan Redmond reminding members and guest to fill out evaluation form
- President-Elect Dan Redmond saying thank you and reminding that next meeting is November 21st, 2017 at the Centurion Conference Centre.

Meeting adjourned 21:07