

ASHRAE Ottawa Valley Chapter

Chapter Meeting # 3 November 2003 Final



Meeting Date: Tuesday November 18, 2003
Location: Capone's Restaurant, 1701 Woodroffe Avenue, Nepean
Presiding Officer: President Jason MacMurdo
Attendance: Total: 70 Guests: 12 Students: 0
Theme Night: Research
Technical Session: Kansas City Update
Table Top: Royal Quickstop - A Division of Royal Group Technologies of Woodbridge, Ontario offers a fresh new approach to the firestop industry with products for firestopping plastic and metal piping and a new space saving product called 'Quickwrap' for protecting commercial kitchen grease ductwork or 1 & 2-hour ventilation air ducting.

Quickwrap Duct Protection is a new fire rated ductwrap solution saving space, time, & money for your kitchen grease duct and ventilation air duct applications.

Program: Presentation on electric motors and motor control.
Speakers: Mr. Arnold Midgley of R.J. McKee Engineering Ltd (Senior Advisor).
Prepared by: Jay Doshi – Jan 28th, 2004

Technical Session (3:45 – 5:15)

- Gemma gave a short presentation on highlights from the ASHRAE Summer Meeting. There was a strong focus on mould in buildings at this meeting, including how to design HVAC to avoid it. Other hot topics included filtration for IAQ compliance, and residential duct problems.

Social (5:30 – 6:30)

Business Session (6:35 – 6:50)

- President Jason MacMurdo opened the meeting and welcomed all in attendance
- President Jason MacMurdo introduced the OVC 2003/2004 Executive and the Board of Governors.
- Glenn MacLean introduced the guests.
- Jason recognized Darryl Boyce as the Vice-President for Society
- Jason informed that the evening program was changed from emergency preparedness to electric motor and motor control. Mr. Arnold Midgley of R.J. McKee Engineering Ltd will present the electric motor and motor controls program.

Dinner (6:50-7:30)

Business Session-Continued (7:30-7:50)

- The theme for the evening was Research.
- Jason MacMurdo informed all of the availability of the table top display opportunity and the benefits. The table top vendor, Larry Whitty - North American Business Manager for Royal Quickstop

briefly addressed the membership and encouraged those present to visit their displays.

- Jason described the technical session and informed that Gemma gave a short presentation on highlights from the ASHRAE Summer Meeting. There was a strong focus on mould in buildings at this meeting, including how to design HVAC to avoid it. Other hot topics included filtration for IAQ compliance, and residential duct problems.
- Jason MacMurdo requested Lan Chi to inform the members about research. Lan Chi talked about resource promotion and the ASHRAE investment in research. She requested all members to participate in research donation. Frank Bann was requested recognize research donors. Each donor was recognized for their contribution including corporate donors.

Break (7:50-8:00)

Evening Program (8:00-9:00)

Program: Presentation on electric motors and motor control.
Speakers: Mr. Arnold Midgley of R.J. McKee Engineering Ltd.

Jason MacMurdo introduced the speaker for the evening Mr. Arnold Midgley of R.J. McKee Engineering Ltd. Mr. Midgley gave a very informative presentation on motors and motor control. He talked about the fundamentals of the electric motor, how it is driven and the 3 phase AC power cycles that drive the electric motors.

As a follow up to a question raised on TEFC (Totally Enclosed Fan Cooled) motors, Mr. Midgley offers the following explanation of the differences between TEFC and Explosion Proof motors:

A TEFC motor keeps out contaminants like water, and chemicals which could attack the materials of the windings and insulation systems, and provides for the removal of the heat from the motor through the external fins and fan construction arrangement.

"Explosion Proof" motors (or more properly, motors rated for operation in hazardous locations) are required in certain hazardous atmospheres, but the requirements are much more stringent, and the resulting construction is much more expensive than TEFC construction.

There are three main types of "Hazardous Locations" covered in the Electrical Code, and each of these has subdivisions or Zones depending on the severity of the hazard.

Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive gas atmospheres. Most people would think of these as explosive atmospheres, and this would cover fuel storage or dispensing areas, sewage containments, and laboratory gas storage/distribution systems.

Class II locations are those which are hazardous because of the presence of combustible or electrically conductive dusts. This would include some grain mills, or grain storage silos, and some wood and metal working facilities.

Class III locations are those which are hazardous because of the presence of easily ignitable fibers or flyings, but in which such fibers or flyings are not likely to be in suspension in air in quantities sufficient to

produce ignitable mixtures. The main hazard here is the piling up of ignitable material on top of electrical equipment, where the heat of the electrical device could set the material on fire. This includes areas such as material weaving and spinning facilities, like cotton processing or blanket factories, and some types of wood working facilities.

For most people, explosive gases are the obvious type of "Explosion Proof" environment. For this location, the motor is required to have a machined set of mating surfaces where the end bell of the motor inserts into the motor frame, to a stated tolerance. This produces a known dimension of crack through which the explosive gas could enter the motor interior, which would limit the amount of gas which could enter. The narrow crack, and high aspect ratio of crack length to width would also quench and cool any flame from the ignition of the small amounts of interior gas set off by the operation of the motor, so that the spark inside the motor could not escape the crack and cause ignition of the atmosphere outside the motor.

For Class III locations, the surface temperature of the electrical equipment is limited to be safely below the ignition temperature of the material, even when heavily insulated by the deposit of the fibers on top of the equipment.

All electrical equipment to be installed in a Hazardous location must be rated for the specific type of hazard, and no electrical equipment is permitted in such an area unless it is required for the operation of that hazardous area. From an economic view also, any equipment which is not required to be inside the hazardous location, should be kept out of the area - for example, a motor may be required in the room to drive a fan, but the starter for that motor can be located outside, and be contained in a normal enclosure. The wiring methods inside the hazardous area are severely controlled and expensive, to prevent the hazardous condition from bleeding into adjacent spaces through the wiring conduit, for example. Special seals in the conduit where it passes into the hazardous area are required, or special types of wiring without any voids inside can be used in certain circumstances.

Because of the high cost of electrical systems inside a hazardous environment, there are ways to avoid having electrical equipment inside. Some lighting systems place the lamp and wiring outside, and carry only the light inside by a "light pipe", a special plastic tube which spreads the light only where required. Instead of a normal thermostat inside the space, the contact portion is outside, operated by a remote bulb inside and a capillary through the wall and sealed around. Wherever possible, such devices should be used to keep the cost and the hazard down.

Each hazardous location needs careful consideration and design to suit the nature and severity of the hazard. The above information is provided to suggest some considerations as a guide for the use of electrical equipment in a variety of hazardous situations.

- Jason thanked our guest speaker for his presentation and presented him with a gift.
- Jason MacMurdo reminded all present of the next meeting on January 20th, 2004.
- With no other business at hand, Jason MacMurdo adjourned the meeting 9:15pm.

Distribution:

Board of Governors

All RVCs

DRC

Please review the minutes and report any errors or omissions in writing to Jay Doshi.