



# NEWSLETTER

INFORMATION & NEWS FROM ASHRAE  
OTTAWA VALLEY CHAPTER

RECEIVED

NOV 13 1986  
NOVEMBER, 1986

JOHNSON CONTROLS LTD.  
OTTAWA, ONTARIO

STATEMENTS MADE IN THIS PUBLICATION ARE NOT EXPRESSIONS OF THE SOCIETY OR OF THE CHAPTER AND MAY NOT BE REPRODUCED WITHOUT SPECIAL PERMISSION OF THE CHAPTER.

P.O. Box 3123 Station "C" Ottawa, Ontario K1Y 4J4

## MEETING - NOTE NEW LOCATION

Date: November 18, 1986  
Time: 4:00 - Tour  
5:30 - Social  
6:30 to 8:00 - Dinner  
8:00 p.m. - Program  
Place: Phileas Fogg  
Metropolitan House, 99 Bank Street  
MacDonald Room  
Menu: (Buffet Style)  
Stuffed Chicken Baked Tourtière  
Assorted Cold Cuts Baby Roast Potatoes  
Complete Salad Selection  
French Crusty - Pumpnickel Rolls  
Assorted Pastry Tea - Coffee

## PROGRAM

Title: Mechanical Challenge to Achieve 'A Dream in the Making'.  
Topic: Our speaker for the evening will be Mr. André Rinfret, Ing. He is a professional engineer with Boutillette, Parizeau and Associates, the firm responsible for HVAC and fire protection system design at the Museum of Civilization. Mr. Rinfret is Project Manager for Boutillette, Parizeau and will present an outline of the design process required by this high profile project.

Come and hear the HVAC designers perspective on this very important project which will certainly evolve into one of the most important landmarks in the National Capital Region.

Host: Dalton McIntyre

## TOUR PROGRAM

The Education Committee is pleased to offer as the second tour the new Courthouse Bldg. Meet at the main entrance on Elgin Street. Be sure to read the mechanical systems outline which is enclosed. Parking at the Met Life Bldg., 99 Bank St. would require only a 10 minute walk.

## PARKING

On street parking: free after 5:30 p.m. 99 Bank, Indoor Parking: \$2.00 flat fee (park your own), after 6 p.m. \$1.00/half hour (valet parking, or park your own), before 6 p.m. (enter on Queen St. and follow ramp to right.)

## NEW ROSTER ON ITS WAY

An updated CHAPTER ROSTER should be ready this month, and will be mailed to all Chapter Members.

This year, all 'Chapter Members' are highlighted to facilitate better communications between those most active in Chapter operations.

If you are NOT a Chapter Member and wish to purchase a copy, call our Chapter Secretary, PAUL BAKER, at 225-8040.

## PRESIDENT'S COMMENTS

November is MEMBERSHIP month for our Chapter, a period when we recognize the need and importance for every member to introduce ASHRAE to a friend or business acquaintance associated with our industry. ASHRAE is people, linked together in a common bond of educational and social needs, the largest society of its kind in the world ... the place to be.

It is also a time when each of us should review our membership status identified on the framed certificate hanging on the wall. Take a look now.

According to our records, a large number of members readily qualify for membership upgrading. If you are presently an Affiliate or Associate Member, take the time now to apply for advancement. Obtain the necessary form from any member of the Chapter's Membership Committee. Once approved by the Admissions and Advancement Committee in Atlanta, your new certificate will be forwarded to you. It's that simple.

The Membership Committee have expanded our display table for the November meeting to highlight the changes that have occurred in our membership profile the past few years. It's well worth your perusal.

At our November meeting, we will recognize one of our members as this year's recipient of the AL OAKES AWARD. In this way, we commemorate the contributions of the Late Al Oakes, who gave much of his time, effort, and enthusiasm in helping to build our Chapter for the good and betterment of present and future members.

In November, the spotlight is on MEMBERSHIP ... the life blood of our Society and Chapter.

John Dugan  
Chapter President

## WANTED: TECHNICAL COMMITTEE CHAIRMAN

The purpose of the Technical Committee is to plan and coordinate subjects for the technical discussions held prior to meetings when no tour is offered. Please call Gord Hayball at 225-6371 if you are interested in getting involved.

## CALL FOR REVIEWERS FOR TECHNICAL PAPERS AND HANDBOOK CHAPTERS

ASHRAE is again asking for volunteers to review technical papers prior to being presented at the annual and winter meetings of the society. The purpose is to broaden the base of reviewers, beyond the technical committee members, to help to ensure the continuing quality of our literature and programs at meetings.

This year they are also asking for Handbook Chapter Reviewers, for the same reasons. Since a Handbook Chapter is much more comprehensive than a paper, the application form allows for a reviewer group of up to four members.

More information and copies of forms will be available at the November meeting for both these reviews. Otherwise you may telephone Dalton McIntyre, Chairman of your Education Committee at (819) 997-3404.

## BUILDING COMMISSIONING CONFERENCE

This year's Energy Management Committee is planning a half-day conference on Building Commissioning. We wish to extend an invitation to all ASHRAE members (and non-members) who would be interested in presenting a paper.

The main theme of the papers should be building commissioning as related to commercial buildings, rather than industrial projects. A broad spectrum of topics is available, ranging from actual commissioning techniques, through to who should have final responsibility for proper commissioning.

The conference is aimed at local ASHRAE members and is to be held in Ottawa during the first week of April 1987. From the turnout of over one hundred people at last year's Indoor Air Quality Conference, we know that people are interested in these areas. For further information, please contact Chris Frauley (Tel. 236-0438).

## OCTOBER MEETING PROGRAM RECAP

Mr. Don Coveney of NRC spoke of the Climatic Engineering Complex. This facility is used to test equipment at extreme temperatures. The equipment tested includes trains, guy wires, tanks, snow blowers, buses, and RCMP padlocks. Mr. Coveney also introduced the sledge hammer blow as a unit of stress. He spoke of methods of manufacturing snow, ice, slush, and freezing rain. The presentation was warmly received by the Chapter.

## NAME THE NEWSLETTER CONTEST

The Selection Committee has chosen a new name for the Newsletter. It will be brought before the Board of Governors at the November meeting for ratification. Look for a new name and logo when this publication returns in the new year.

## AL OAKES AWARD

The Al Oakes Award of Excellence for 1986 will be presented at our Chapter meeting in November. The Award is given in recognition of exemplary service to the Chapter and ASHRAE, in a manner reminiscent of the devotion and enthusiasm that characterized the late Al Oakes. Previous recipients of the Award are George Carscallen, Paul Baker and Keith Murfin. Be on hand to welcome and honour our choice for 1986.

**WANTED: PUBLICITY AND PUBLIC RELATIONS COMMITTEE CHAIRMAN.** The purpose of the Publicity and Public Relations Committee is to provide communication of noteworthy events to the public at large and within ASHRAE Society. The committee is the Ottawa Valley Chapter's liaison with the local media, other professional societies, the ASHRAE Journal and ASHRAE Insights. Please call Bill McKinnon, 731-8720 if you are interested in learning more about the challenge to be met.

**VCR TAPE LIBRARY:** The following tapes may be borrowed from our library: Forgotten Fundamentals of the Energy Crisis (VHS, BETA). ASHRAE's Chapter Program for Professional Excellence (VHS) Presidential Message 1985/86 (VHS), Develop our Human Resources - Presidential Message 1986/87. Please contact Bill McKinnon, 731-8720.

## GET YOUR 'GRADES' UP

If you have been an Associate or an Affiliate member of ASHRAE for over 5 years, then your employment experience, level of responsibility, and/or additional training is likely to qualify you for an 'ADVANCEMENT' of your 'GRADE' of membership.

To receive an "ADVANCEMENT INFORMATION PACKAGE" in the mail, just call KEITH MURFIN, 226-3300, or pick one up from the Membership Display Table at the Chapter Meeting.

- THERE ARE NO FEES OR COSTS FOR ADVANCEMENT -

## WELCOME NEW MEMBERS

We proclaim a sincere "WELCOME" to the following who have recently joined, or re-joined ASHRAE:

Jim Adams	Ramex Systems Ltd.
* Jim Armstrong	E. W. Playford
Antal Bakaity	Aerodynamics Inspecting Ltd.
Gary Beatty	Capital Air-conditioning
* John Catto	Keeprite Inc.
* Frank McGraw	McGraw Automation Services
* Barry Tate	DHM Energy Consultants
Robert Teakie	VCI Controls Inc.
* Michael Tzopa	Enertectonics

Also, a warm "WELCOME TO OTTAWA" to those ASHRAE members who recently moved into our area ...

Rudolph Koci	Vanier College (Montreal)
Randy Lagerway	Energy Mines & Resources
* Rod Lancefield	Carrier Canada Limited
* Brent Wilson	D.S. Fraser Equipment Inc.

\* (Those names with an "\*" asterisk have also already taken CHAPTER membership.)

## NOVEMBER IS MEMBERSHIP MONTH!

Bring a guest ... Tell a colleague ... Meet a new member ...  
SHARE YOUR KNOWLEDGE ... Keep an application form handy ... see you on TUESDAY!

## SELF - TEST

### HOW WELL DO YOU KNOW OUR INDUSTRY?

ASHRAE involvement is a great leap forward in gaining education and knowledge about people, marketing, technical matters, and business in general.

How many: new members joined ASHRAE in our area so far in 1986?  
(answer: 50)

How many have you met so far?

How many: associates do you know who could benefit by becoming an ASHRAE Member?

Do you know the name of our Membership Chairman, from whom they might obtain information about ASHRAE?  
(answer: Keith Murfin, 226-3300)

How many: people are actively involved in the administration of our CHAPTER, on committees, as chairpersons, on the Board of Governors, etc.)  
(if you guessed over 70, then you're RIGHT)

## CHAPTER MEMBERSHIP

Our membership count, as at the end of October:

SOCIETY MEMBERS - 360 (plus Students)  
CHAPTER MEMBERS - 160

Our OTTAWA VALLEY CHAPTER area includes Western Quebec, up to Montebello, and Eastern Ontario, from Pembroke and Kingston to Cornwall and Hawkesbury.

Those Society Members who still are awaiting the opportunity to become CHAPTER MEMBERS, should call our Chapter Treasurer with any questions.

**BENEFITS INCLUDE:** improved communications; reduced costs at Chapter Meetings; free ROSTER of Society members; personalized membership BADGE; highlighted name listings; automatic telephone contacts; occasional savings at special events.

**SWEENEY'S LAW:** The length of a progress report is inversely proportional to the amount of progress.

## COURTHOUSE MECHANICAL SYSTEMS

### 1. MECHANICAL INTRODUCTION

A central equipment room located on Level 6 houses main centralized mechanical equipment such as chillers, boilers, building supply and return fans, heat exchangers, pumps etc.

The mechanical systems include features designed to minimize energy consumption. Heat generated from lights and occupants is stored in the interior of the building and then transferred to the building perimeter to offset the winter heating loads. During summer operation at night, the building mass is cooled, reducing cooling costs as the building is 'flushed' with cool outdoor air to reduce chiller operation the following day.

Heat recovery takes place between building exhaust and fresh air supply systems. The garage is partially heated from building waste heat.

All building systems are under the control of a direct digital computer control system, providing optimum HVAC equipment response to varying modes of building operation.

### 2. ENERGY CONSERVATION FEATURES

Compared to traditional construction, this building has reduced energy requirements resulting from a tight envelope and increased thermal resistance in walls, ceilings and windows.

Reduced energy consumption by main air handling unit fan drives is accomplished by using variable speed motor control to modulate system capacity. Supply air volume is controlled to main a fixed static pressure. Inputs from electronic (accurate to 100 fpm) air flow measuring stations in the supply and return air streams through the computer equation processor provide the correct return air tracking to maintain positive pressure in the building under varying volume flow.

The fresh air inlet incorporates a two-stage system. The first stage is sized to provide the building with a constant minimum, fresh air quantity, with a minimum fresh air fan and a heat recovery coil whose source of heat is a similarly sized coil on the building exhaust systems located in the basement. The second stage operates to allow free-cooling during mild weather, and has 100% fresh air capability.

After the building exhaust and washroom exhaust has exchanged heat with the minimum building fresh air, this air is directed into the garage as make-up to reduce garage heating requirements. Additionally, heat lost from the main electrical transformers is recovered by directing the exhaust air through the transformer vault.

2. ENERGY CONSERVATION FEATURES - cont'd.

Two multi-stage centrifugal chillers are used for cooling. Operation of the chillers is sequenced to improve the part load performance of each machine and increase the operating range of the system.

During unoccupied hours, the normal tendency of the building is to overheat in the summer, while the cooling systems are turned off. A building purge with 100% outside air in the early morning hours helps to reduce building start-up loads. In addition, the building may be pre-cooled in advance of the occupied hours, thereby using the building mass to help offset peak chiller loads. The space temperature set-points are allowed to 'ramp' up during occupied period, from 21°C in the morning to 24°C at the end of the day.

The building mass is also used in winter operations. In this case, the heat generated within the building and stored in the structure during the day is extracted during night operation by forced air heating systems. As the air moves from the perimeter (where it is supplied), through the ceilings and towards the building interior, back to the heating fan, the heat stored in the structure is recovered and released when the air is again supplied to the cooler perimeter.

Garage ventilation systems introducing fresh air to the parking garages are controlled by a carbon monoxide monitoring system. Normally these systems will not operate because the building exhaust and washroom exhaust supplied to the garage are sufficient to prevent CO build-up.

3. FORCED AIR SYSTEM

The building is air conditioned by means of two main air handling units located in the mechanical penthouse. Each unit is capable of supplying approximately 47,200 L/s using axial fans on both the supply and return systems. In each case the fans are duplexed to provide staging and standby capabilities.

Variable volume capability is accomplished using variable frequency drives instead of dampers for maximum efficiency under part load requirements. The correct amount of cooling is supplied to each space by variable air volume boxes which use remote computer control to measure and adjust air flow.

4. THERMAL STORAGE SYSTEM

The perimeter heating system takes advantage of the thermal storage capabilities of the concrete structure to reduce energy consumption. The surface area of the structure has been increased in many places, using waffle slab construction to increase the heat transfer.

.5 HEATING AND COOLING WATER SYSTEMS

Condenser water to and from the cooling towers (two modules) is modulated to provide heat rejection when necessary. When building heat loss exceeds the heat rejection capability of

## 6. HEATING AND COOLING OPERATING MODES

Enthalpy analysis by the computer control system decides whether it is more economical to treat return air mechanically using the chiller and cooling tower, or to introduce more fresh air to the building. Up to 100% fresh air may be used for cooling until ambient air temperatures reach room air temperatures, at which point fresh air will be reduced to the minimum setting and all cooling is done mechanically once again.

During unoccupied hours in winter, normally only the perimeter heating system will run. It is necessary to cycle the main supply fans during the coldest weather in order to transfer the heat stored in the Courtroom areas. No outside air is introduced under this condition and the system operates as a recirculating system only.

The overall building temperature is allowed to fall to a minimum of 16°C at night. Optimum start is used to initiate the heating system early enough to make sure that a minimum temperature of 20°C is achieved in all occupied areas by the start of the day. The necessary advance time is calculated by the control system and varies with the outside temperature.

Night operation in summer weather sees all systems shut down and the building temperature is allowed to float uncontrolled. The building heat may be removed by purging the building during the early morning hours. Optimum start is also used to make sure that a maximum temperature of 26°C is not exceeded in other occupied areas when the building is about to be used.

## 7. GARAGE VENTILATING AND HEATING

The parking garage is maintained at 7°C.

Normally, the exhaust air pressurizes the transformer vault and forces past the garage/transformer vault ventilation fan. When high CO is detected, the building exhaust is dumped directly into the garage and fresh air is drawn through the vault from outside.

## 8. ENERGY MANAGEMENT AND CONTROL SYSTEM

The Energy Management and Control system for the mechanical and electrical systems in the building is designed to meet the following objectives:

- Capital and Operating Cost
- Reliability
- Energy Conservation and Energy Budget
- Remote Monitoring & Control of Mechanical and Electrical Services with alarms
- Fully Unattended, Automatic Operation

9. FIRE PROTECTION

a. Sprinklers

The entire building, with the exception of the transformer vault, is sprinklered in accordance with NFPA 13 and I.A.O recommendations.

b. Standpipe System

A complete fire standpipe system is provided throughout the building; with cabinets located adjacent to exit stairs.

c. Smoke Control Systems

Smoke exhaust is provided at the top of the Atrium capable of exhausting at a rate of 6 air changes per hour.

Replacement air is introduced through the main entrance doors which open automatically in case of fire.

Exit stairs are pressurized upon a fire condition.