President letter

Building a better world for our HVAC&R community

I feel honored to present this issue of ASHRAE Cairo Chapter Newsletter to our members and partners in the HVAC&R field. After one year of efforts and contributions, the board achieved the following accomplishments:

- **The Technology Transfer Activity**
  Sessions & courses had been conducted in our chapter by some of the best lecturers in the field. In addition some in-house sessions had been given to companies & factories.

- **New ASHRAE Student chapters**
  The board succeeded to create new student chapters in Alexandria University & Arab Academy for Science, Tech. & Maritime Transport.

- **History of HVAC&R in Egypt**
  A new committee have been established to record the history of HVAC&R in Egypt. The committee succeeded to interview the old pioneer Eng. Anwar Al Attar.

- **The Technical Lecture Activity**
  A number of sessions had been held by some of the best specialist & Consultants in the HVAC&R field.

- **Adel Barakat Award**
  The Board established this award sponsored by Adel Barakat family to be given annually to the best Under graduate Student HVAC Project.

- **Prof. Dr. Mahoud Fouad Elected As The Chairman of (RAL)**
  ASHRAE Cairo chapter is thrilled to congratulate our members for the appointment of Prof. Dr. Mahmoud Fouad to be the first Egyptian to become the Chair of ASHRAE Region at Large (RAL) – Sub Region (A) (including ASHRAE chapters in Middle East and African countries). This achievement is considered as a recognition of both Dr. Mahmoud Fouad's personal achievements and ASHRAE Cairo Chapter's renowned work.

I hope that the contributions of all board members as well as the volunteers will continue to support ASHRAE Cairo chapter to achieve more successes in the future.
ASHRAE Cairo Chapter Exhibition 2008

ASHRAE EXHIBITION COMMITTEE

ASHRAE exhibition for air conditioning and refrigeration industries has become an annual event that observed by all professional concerned. This year our exhibition will be held on 19 June 2008 associated with INTER BUILD EXHIBITION.

The Egyptian market is experiencing an increasing activities in the construction fields, experts expect 30% increase in demand for air-conditioning market, I encourage all interested in this business not to delay participation in this exhibition.

I also invite consultants & engineers working in this field to attend the associated technical sessions where technical topics will be presented by a group of well selected lecturers as well as company presentations.

ASHRAE Historical Committee

HISTORICAL COMMITTEE REPORT

Historical Committee member and ASHRAE representatives have made a visit to EGAT Company to meet Eng. Anwar El Attar, the president of the company & one of the pioneers in the field of HVAC industry in Egypt.

The aim of the visit was to make number of interviews with him to record the HVAC history in Egypt since 1919 till now.

The Committee has recorded this visit on a C.D & it was decided to make other visits later to record his memories about the progress of the industry & to discuss the important air conditioned places at that time.

Finally, the visit was attended by:
- Eng.: Alaa Kamal
- Eng.: Mohamed Mansour
- Eng.: Emad Mokhtar
- Eng.: Salah Soliman
- Eng.: Maged Fouad
- Eng.: Khaled Emad
ASHRAE Scientific & Technology Transfer Committee Work Plan Year 2007- 2008

1- Continuing Education Courses:
Eight different post experience courses will be offered at the rate of one course per month starting from July 2007. These courses are composed of structured guided instructions ranging from the first principles up to the field problems they are of pragmatic nature designed to help practicing HVAC & R engineers.

1- Principles of Water System Design.
2- Principles of Air System Design.
3- Principles of HVAC Control Systems.
4- Principles of Refrigeration.
5- Principles of HVAC Systems.
6- Principles of Heating & Cooling Loads.
7- Principles of Thermodynamics and Psychometrics.
8- Principles of Electrical Systems and Building Electrical Energy Use.
9- Principles of Heating Systems.

2- Annual conference accompanying the yearly Exhibition June 2007
In prolongation to previous years immense success, we plan to offer from 22 to 24 technical Seminars in HVAC & R field during this conference which takes place in an annual basis in association with ASHRAE Cairo Chapter exhibition. The Topics of the seminars are very carefully planned to be of practical nature covering a wide spectrum. Theses Seminars will be delivered by the highly reputable experts in the HVAC & R discipline. The conference, which has acquired an elevated standing in the past few years is usually characterized by the soaring level of technical discussions following each seminar.

3- ASHRAE Joint Company Seminars
Practical and Technical Facts are combined together in beneficial ASHRAE nights sponsored by selected first class companies.
ASHRAE Cairo Chapter Program for Technical Lectures And Seminar For The Year 2007 - 2008

The seminar and technical lecture committee announced its activity program for the year 2007-2008. The program is organized to present a collection of well-selected technical lectures of interest to refrigeration and air conditioning engineers. The aim of the program is to enrich the knowledge of engineers working in the field of HVAC, and to establish some means of knowledge exchange. Among the topics that are included in this year's program are and other important topics. The committee is pleased that all interested engineers (ASHRAE members and non-members) had attended these useful lectures and seminars. The committee will also be delighted to receive any suggestions for possible topics and candidate speakers for future program.

ASHRAE Technical Lecture Program (2007-2008)
(Tentative Program As Per April 22, 08)

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<td>Architectural requirements from HVAC Systems</td>
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<td>Dr. Maha Abd el-Latif</td>
<td>Validation over view and clean room validation</td>
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<td>30-Mar-08</td>
<td>Dr. Ahmad Hozayyin</td>
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<td>Prof of Mech. Eng., Institute of Technology - Benha University</td>
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<td>20-Apr-08</td>
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<td>06-May-08</td>
<td>Eng. Sabry An-Naggar</td>
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<td>Dr. Ahmed Medhat</td>
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Adel Barakat Award

On the memory of the Late Eng. Adel Barakat the past honorary President of ASHRAE Cairo Chapter, the Barakat Family represented by Eng. Hazem Barakat and Mrs. Mona Barakat had graciously donated a sum of 100,000 LE as bond whose yearly interest would be allocated as an award for the best graduation project on Air Conditioning and refrigeration in Faculty of Engineering in Cairo, Ain Shams and Alexandria Universities. A selection and refereeing committee was formed of experienced University professors and consultants in the field to select the best project based on the selection criteria set by ASHRAE.

On this occasion ASHRAE Cairo Chapter would like to express their thanks and gratitude to the Barakat family for their encouragement, fostering of ASHRAE activities and encouragement of young engineers in Air Conditioning and refrigeration fields.

ASHRAE Cairo Chapter Electronic Software library

ELECTRONIC LIBRARY COMMITTEE

Dear readers, proudly our Cairo chapter with its magnificent board members have established to all the HVAC engineers, specially for the ASHRAE Cairo Chapter members an integrated electronic library. This library includes topics of the HVAC systems design, software for HVAC equipment and the updated ASHRAE codes with its definitions and applications.

This service has been launched for the members on the end of last February 2008, hopefully this electronic library will help to raise the knowledge of HVAC engineers.
Air Conditioning of Multipurpose Halls

Essam E. Khalil
Professor of Mechanical Engineering, Cairo Univ. Egypt
Chairman Arab Air Conditioning Code Committee

When designing an efficient air conditioning system for multipurpose halls, care should be exerted to satisfy the following requirements:

1. Temperatures: The temperature should be controlled by change of supply temperature without any airflow control, and to minimize the difference between the warm and cool regions decrease the airflow drift.

2. Relative Humidity Control: The most proper conditions of Relative Humilities are between 35% and 50%, figure 1.

3. Airflow Velocity Control: No air flow should induce any draft or discomfort to occupants, and should also be high enough to enhance the heat transfer characteristics. Air velocities should be less than 0.2 m/s at 1.0 m above ground (in occupancy zone).

4. Ventilation: Air volume flow rates are to be calculated to take up the thermal load of the hall and to scavenge any void air. ASHRAE Standards 62 regulates these ventilation rates for different application.

5. Air Filtration: Air filtration system will be designed to achieve indoor conditions comparable with ASHRAE Standards. First stage will be primary filter located inside the AHU with an average efficiency of 30%. The next stage filter located also in the AHU’s will be high efficiency bag type having an efficiency of 80-85%. A third filter stage of High Efficiency Filter can have filtering efficiency of 99.9%.

6. Pressure Relationships and Ventilation: Depending on applications, rooms can be positively pressurized to prevent any infiltration, or negatively pressurized to prevent any exfiltration.

7. Air Movement: Undesirable airflow between rooms and floors is often difficult to control because of open doors, movement of staff and personnel, temperature differentials, and stack effect, which is accentuated by the...

Figure 1: Comfort Chart (ASHRAE)
vertical openings such as chutes, elevator shafts, stairwells, and mechanical shafts common to buildings.

8. **Air Quality:** HVAC systems must provide air virtually free of dust, dirt, odor, and chemical and radioactive pollutants.

9. **Smoke Control:** A proper smoke control strategy must be considered. The ventilation system may be used in a smoke removal mode in which the products of combustion are exhausted by mechanical means.

10. **Fire Control:** Fire dampers will be installed in all supply, return, and exhaust air ducts where these ducts pass through 2-hour rated firewalls. Smoke dampers will be installed in each duct penetration of 1-hour rated smoke partitions and shafts.

11. **Noise Criteria:** The design will incorporate provisions for sound control in order to achieve an appropriate sound level for all activities and people involved.

To properly design air Conditioning system for large spaces the following factors should be considered:

- Simplicity of design and
- Of proper capacity for a given building
- Of generally fairly low maintenance
- Of low operating costs.
- Of optimum inherent thermal control as is economically possible.

Example of life cycle cost analyses for 800 TR (2800kw cooling) commercial system, total 2500 m² in Cairo is shown here in Fig. 3.
Smart Dedicated Outdoor Air Systems

The HVAC unit is responsible to maintain space temperature by re-circulate indoor air, as space need outdoor air for ventilation purpose, it is better to supply outdoor air treated separately from the reticulated indoor air by a providing a dedicated out door air unit (OD air unit), this will achieve the following:

- Verify sufficient ventilation air.
- Control the maximum humidity limit in space.

To optimize the installation cost & the energy use of dedicated OD air system consider the following requirements:

1. Deliver Conditioned OD Air Drier than the Space

The dedicated OD air unit should dehumidify the OD air and deliver it drier than the space, this will offset the OD air latent cooling loads and may offset some or all the space latent loads reducing the moisture condensate on the local unit coil and reduce the potential to clog or over flow drain pass.
2. **Deliver Conditioned OD air Cold rather than Space Temperature (Natural)**

OD air dedicated unit will dehumidify OD air to be drier than space and at dry bulb temperature lower than space temperature so it can offset part of sensible cooling load, and this will result in a reduction in the cooling capacity & CFM of the local HVAC unit.

3. **Consider After – Hours Humidity Control**

At the after-hours times, when no OD air is needed but space dehumidification control is required the dedicated OA air unit can be provided with return air path, so at that time OD air damper closes and opens the RA damper to re-circulate space indoor air and make the required control of humidity.

4. **Use Exhaust Air Energy Recovery**

It is recommended that OD air dedicated unit is equipped with an exhaust air energy recovery device to precondition the OD air (Fig.3), this will reduce the operating cost and minimize the capital cost of the OD air system.

ASHRAE CAIRO CHAPTER's PREVIOUS PRESIDENTS

Prof. Dr. Hany Olama 1997/1998
Prof. Dr. Mahmoud Fouad 2000/2001
Prof. Dr. Essam E. Khalil 2004/2005
Dr. Alaa Olama 2002/2003
Prof. Dr. Mamoud Fouad 2005/2006
Cairo Chapter Awards 2007 - 2008

**Prof Dr. MAHMOUD AHMED FOUAD**

**EDUCATION AND PROFESSIONAL MEMBERSHIPS**

Ph.D. Mechanical Engineering, Salford Univ., England 1979

M.Sc. Mechanical Engineering, Cairo Univ., Egypt 1974

B.Sc. Mechanical Engineering, Cairo Univ., Egypt 1972

Member of the American Society of Heating, Refrigerating and Air Conditioning Engineers (Immediate Past President of the Board of Governors, Chairman of Scientific, Technology Transfer committees)

Member of the American Society of Mechanical Engineers

Member of the British Building Services Research and Information Association

Member of the Canadian Association of University Teachers

Licensed Specialist Technical Consultant - Registered Professional Engineer

**ENG. MOHAMED KHALAF**

B.S.C. in mechanical engineering power section faculty of engineering

Cairo university

Graduation: June 1969

Key Qualifications:

- Design and supervision of HVAC systems.
- Design and supervision of refrigeration system.
- Design and supervision of some of thermal environmental engineering.
- Perform of value engineering.
- Preparation of cost estimates for budget control.
**ENG. SHERIF ALY ZAKY**

**First Job:**
Company Name: Tractors and Engineering Co. (Public Sector)
Company Profile: One of the largest company in H.V.A.C. contracting in the 60’s & 70’s.
Job Description: Working as a site engineer after graduation and accomplishing the military service till 1980.
Some of the Projects executed under his supervision:
- Cairo Meridian Hotel.
- United Kingdom Embassy.
- Seid Pharmaceutical Company.
- Maadi Military Hospital.

**ENG. MOHAMED ALY HASSAN**

**KEY QUALIFICATIONS**
Over 37 years of professional experience in corporate and project management of multidisciplinary HVAC, fire fighting, plumbing & cold stores installations in Egypt and Nigeria.
As a Corporate Manager of one of the leading companies, we successfully completed major prestigious projects such First Residence in Abo Soma Bay, Sheraton- Safaga, Rhinson Club in Safaga Swiss Pharma buildings in Cairo and many others.
As project manager I successfully managed and completed major HVAC, plumbing and Fire Fighting of major hotels, office buildings and industrial plants such as the Semiramis Intercontinental, Nile Tower office Building Many.
Served as Technical Manager for a Fiber Factory in Nigeria and as Site Mechanical Engineers for a major Egyptian Contracting Firm.
Attended several professional development courses in Cairo and several technical and marketing courses by International Companies.
Photo Gallery

ASHRAE Lectures

ASHRAE Courses
Organization Chart for ASHRAE Cairo Chapter 2007/2008

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