美國供暖製冷及空調工程師學會 香港分會 www.ashrae.org.hk

ASHRAE LINK

THE NEWSLETTER OF HONG KONG CHAPTER OF THE AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.

OCTOBER 2004

ASHRAE Annual General Meeting (AGM)

Group photo taken of Annual General Meeting.

The Annual General Meeting (AGM) of ASHRAE Hong Kong Chapter was successfully held at Function Room, Luk Kwok Hotel, Wan Chai on 27 May 2004 (Thursday). Our president, Mr. Vincent Chu, gave us a report after the confirmation of the minutes of the nineteenth AGM. He sincerely expressed his gratitude to Governors and Committee Chairs and Members, who contributed their effort and time to ASHRAE and Hong Kong Chapter during 2003-04. He reported that the chapter programs were run successfully, including ASHRAE Hong Kong Chapter 20th Anniversary Dinner, ASHRAE Night, Board of Governors Meetings, various Committee Meetings and a number of ad hoc working meetings.

Following the president's report, Dr. C.M. Hui, Treasurer of 2003-04 gave the financial status and report of the Chapter in the financial year. After that, the following officers and members of the Board of Governors were elected for 2004 - 05.

The incoming president, Mr. Tim Cheng, kindly delivered his speech to the audience and received the Certificate of Appreciation from the president, Mr. Vincent Chu.

President	:	Mr. Tim Cheng
President-Elect	:	Mr. T.K. Chan
Hon. Secretary	:	Dr. Sam C.M. Hui
Hon. Treasurer	:	Mr. Rocks Li
Governors	:	Mr. W.K. Pau
		Mr. Vincent Tse
		Mr. Edward Tsui
		Dr. Philip Yu

Group photo taken of Historian Chair **Dr. Roger Chu** (Center), and Board of Governors, **Mr. Edward Tsui**, **Mr. Vincent Tse**, **Mr. W.K. Pau** and **Dr. Philip Yu** (left to right).

Presentation of the Certificate of Appreciation to incoming president, **Mr. Tim Cheng** by president **Mr. Vincent Chu** (left to right).

CONTENTS

ASHRAE LINK *is published by the ASHRAE Hong Kong Chapter. Statements made in this publication are not expression of the Society or of the Chapter, and may not be reporduced without special permission of the Chapter. The newsletter is accepting letters to the editor and article submission on topics of interest to the members of the Chapter. Materials should be sent to us by post or e-mail.*

Editor:
Mr. Jacob Yiu

Associate Editor:
Mr. Fu-wing Yu
Ms. Allison Law
Mr. Hugh Leung

Editorial Board:
Board of Governors of ASHRAE Hong Kong Chapter

E-mail:
newsletter@ashrae.org.hk

By Post:
P.O. Box 35612, King's Road Post Office, North Point, Hong Kong, China

Leadership Interview with Dr. Daniel W. T. Chan

個人方面

1. 您選擇了屋宇設備工程為職業，是否對屋宇設備工程有特別的情意結？

我大學時選修機械工程，後諗碩士主修流體力學，第一份工作乃關於聲音控制，後來得到Parsons Brinckerhoff (Asia) Ltd（柏誠）負責人Philip Chien賞識， 1980年開始任職此公司，直至1987年任教理工大學（前理工學院）屋宇設備工程學系至今。我認為不是我選擇屋宇設備工程，而是屋宇設備工程選擇了我，情繫半生。

2. 您任教理工大學屋宇設備工程多年，作育英才，可否分享箇中苦樂？您的教學目標是什麼？

在多年教學生涯，苦真談不上，反而樂事較多，令我很享受工作。 我的座右銘 - 要處理的事情多的是，但我不忙。 秘訣是懂得分配優先次序。我認為值得一提的樂事有二：一是將學系課程成轉化活動教學模式，和學生的距離拉近，在鼓勵過程中，享受學生成長過程的樂趣；二是令學生了解學習真正的目的及正確的取向，修正這方面的誤解而減輕學習上的心理壓力。尤其對兼讀深造的學生，我也時而輔導及紓解他們日常工作及家庭關係的壓力。至於教學目標亦有二：一為除灌輸學問，同時激發其專業及修養，並留意市場變化，有助其未來事業發展；二為致力持續發展屋宇設備學系，望能在本土學院手執牛耳，成為先鋒。

3. 作為屋宇室內環境素質 (Building Indoor Environment Quality) 的專家，提倡室內素質要溶入社會及經濟，可否深入闡釋其意？

要設計出高質素的屋宇設備並不難，但要了解客戶要求及與其接軌實非易事。我們在設計上時常犯的毛病是設計欠缺彈性，未能滿足市場需求。以屋宇室內環境素質 (Building Indoor Environment Quality) 為例，便要同時顧及投資回報、用家及操作維修三方面的需求。在設計上，先與投資者定出設計方向 (Aims)，以用家滿意程度為本 (Satisfaction Approach)，環保道德為引，定立目標 (Objective)。再採用專業模式，設定準則，如設計、建造、測試、調較、操作及維修，能達到這些準則 (Criteria)，便能滿足用家的要求，亦在持續發展 (Sustainability) 的情況下，為投資者帶來既定的回報。 設計有否有生命，乃主導於屋宇設備專業人士行為。

工程界見解

1. 您教學多年，對初出茅蘆的畢業生有何提點？您對他們有何寄望？

希望畢業生不懼辛苦及不計較付出，學無止境，對將來事業必有裨益，然後可回饋工程界。達到這境界，事業必有成，生活亦無憂，心中也無憾。回顧中，充滿快樂回憶；向前瞻，前境一片光明。寄望他們能成為真正的註冊專業工程師，專業工程師必須具備廣闊目光及給予正確的專業意見。付出乃收成之母，與初生之犢共勉之！

2. 各界大都認同CEPA及全球一體化對各行業俱有正面影響，您認為對工程界有何影響？

CEPA及全球一體化必會帶來許多就業機會及商機，尤其是高科技行業，但同時會出現兩極化，高科技及專業行當迅速增值。 一般技術的回報不僅不能隨時間而增長，反因市場的供求而貶值。 年青人不妨考慮接受較高但能估算風險的出路，擴大發展空間， 迎合多方面的機會，讓專業不斷攀上新的高峰。

ASHRAE 方面

1. 您服務ASHRAE HK Chapter 長達十多年，請談談您對這個大家庭的一番情懷。

自1992 年當上會長至今已十多年，感受到ASHRAE HK Chapter 是一個快樂的大家庭，略別其他學會，因歷任會長大多留下繼續無私地回饋，並在Student Branch發掘新血，老中青三代濟濟一堂。 而作為Student Adviser多年，看見許多理大Student Branch的畢業生都回饋HK Chapter，作出貢獻,桃李非滿門，桃李多有成，感到很欣慰。

2. 在ASHRAE的二十多年，最引以為榮的成就是什麼？何事令你印象最深刻？

令我最引以為榮的成就是我在1991年與理工學院（理大前身）、香港工程師學會及英國屋宇設備工程學會合辦第一屆Joint Symposium - 主題為 "Sick Building Syndrome and Building Related Illness"。這個合作模式成為每年屋宇設備工程專才學術交流的一個重要項目。印象最深刻的是我於1992年為ASHRAE HK Chapter 編制第一期ASHRAE Link，ASHRAE Link 在這十二年間經過熱心的會員多次改革，仍是HK Chapter與會員主要的溝通橋樑，沒有枉費我的一番心血，喜甚！

後感

筆者有幸是Dr Chan 其一桃李，與老師一席話後，頓然激發自己對前路的思索及必須自我增值，印證了老師其一教學目標。老師字裡行間都表現出為師為ASHRAE會員的熱忱及抱負，細味之必有所益。

*Photo taken of **Dr. Daniel W. T. Chan** (right) and **Mr. Jacob Yiu.***

20th ASHRAE Soccer Tournament 2004

Photo of IFE-HKB Soccer Team.

Photo of CIBSE-HKB Soccer Team.

20th ASHRAE Soccer Tournament 2004, one of the 20th Anniversary celebration events of ASHRAE Hong Kong Chapter, was held on 20 March 04 and 10 April 04. It was our pleasure from the participation of HKIE-BSD, CIBSE-HKB and IFE-HKB. Unlike formal seminars or meetings between our friendly institutions, the soccer tournament not only can provide opportunity for engineers from different disciplines to share their experience on soccer skills, but also develop their friendship during this event. The event was successfully organized and was full of happiness. ASHRAE soccer team won 1st runner-up in the final: it beat HKIE-BSB 6-0 and lost IFE-HKB 3-0.

Photo of HKIE-BSD Soccer Team.

Photo of ASHRAE Soccer Team.

In Memory of Mr. Wang Shan-kou

We are very sad to learn that our beloved air conditioning & refrigeration pioneer and teacher, Mr. Wang Shan-kou, passed away in USA on 18 March 2004. Mr. Wang is also known as the "Father of HVAC&R in Hong Kong" because he has devoted many years in teaching the subject and has published several educational packages and reference books on HVAC&R. His publications are well received in the industry and his diligence in promoting HVAC&R technology is well respected in Hong Kong, Mainland China and worldwide.

Mr. Wang was a committee member supporting the formation of the ASHRAE Hong Kong Chapter and has contributed to the chapter development in the 1980s and beyond. His significant achievement in ASHRAE and dedication to HVAC&R industry will be remembered by heart by every one of us.

Further info of Mr. Wang can be found on website: **http://aabse.org/skwang/index.html**

Use of Building Energy Simulation for Building Energy Codes

Dr. Sam C. M. Hui

Abstract

Building energy simulation is playing an increasingly important role in building services design. This article explains the important issues affecting the use of building energy simulation for building energy codes. The background and development of building energy codes is briefly described. The rationale and important issues of performance-based building energy codes are explained. The key factors for effective simulation skills are discussed.

Introduction

Building energy simulation is playing an increasingly important role in building design. A review of the relevant literature will show a healthy and growing application of building thermal and energy simulation tools to building design problems in many parts of the world (Clarke, 2001; Hui, 1998; Wong, Lam, and Feriadi, 2000).

To promote energy conservation and control building design, many countries have developed or upgraded their building energy codes in the past decade (Janda and Busch, 1994). Very often, building energy simulation tools are being used to establish the basis for the building energy codes. Moreover, they are also taken as the evaluation method for performance-based building energy codes.

However, as building energy simulation is a complicated process, building designers and practitioners often find it difficult to comprehend. Even experienced energy modellers are sometimes puzzled by a wide range of simulation software and the issue of validity and accuracy.

Building Energy Codes

Building energy codes are used to provide a degree of control over building design and to encourage energy efficient design and operation of buildings. Traditionally, they are prescriptive in nature as they specify for each building component the minimum requirements to satisfy the code, such as minimum insulation levels and equipment efficiencies. Prescriptive codes are simple to use and follow, but they tend to limit design freedom and innovation. Also, they are not able to consider the interactions between different building systems and the measures that would optimise their combined performance.

Figure 1 shows the major elements and compliance paths for modern building energy codes. The basic/mandatory requirements on the top are fundamental issues that must be satisfied all the time. After that, there are three options for code compliance.

(a) Prescriptive requirements: they are the "deem-to-satisfy" conditions.
(b) System/component performance: a partial-performance path that allow "trade-offs" in some design parameters within the sub-system.
(c) Energy budget/cost: a full-performance path usually requiring detailed energy calculations.

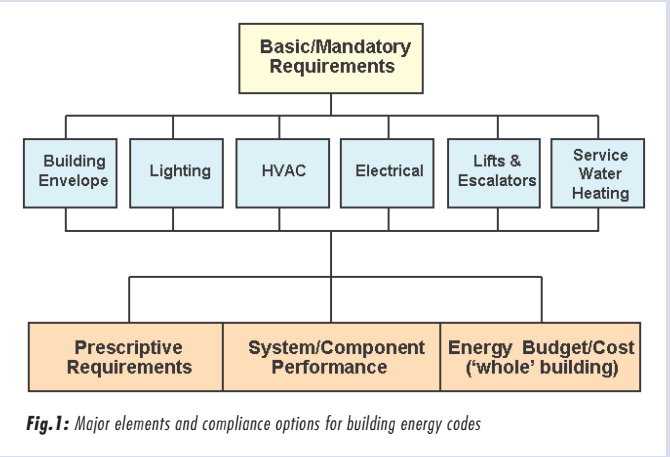

Fig.1: *Major elements and compliance options for building energy codes*

Building energy simulation is often used to generate information for designing the codes. For example, the OTTV method is developed based on simulation and multiple regression analysis.

Performance-Based Approach

To consider 'whole' building energy performance, a performance path using an energy budget/cost method can be used (e.g. in ASHRAE Standard 90.1). Compliance is established by calculating the energy consumption/cost for the proposed building and ensuring that it does not exceed an energy budget or target (ASHRAE, 2001a). The calculation is often based on building energy simulation.

The so-called 'performance-based building energy codes' is to compare annual energy use of a proposed building to a similar prototype or reference building. Compliance is achieved if the annual energy consumption for the proposed building is less than or equal to the annual energy consumption for the reference building. Figure 2 shows the compliance procedure.

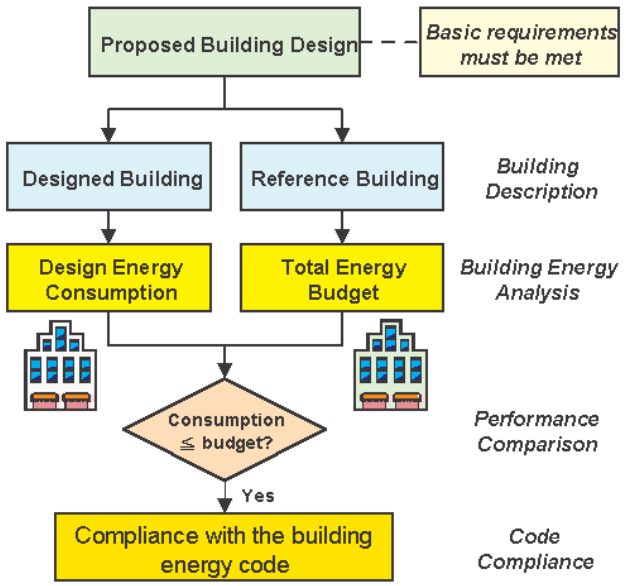

Fig.2: *Compliance procedure for performance-based building energy code*

Rationale and Important Issues

The performance-based code sets a maximum allowable energy consumption level without specification of the methods, materials, processes to be employed to achieve it. The onus will be on the designer to present a design solution together with appropriate predictive evidence of its energy behaviour. For a fair and consistent comparison, it is necessary to specify the simulation process. The software tool, simulation procedure and modelling assumptions must be clearly defined to avoid cheating and manipulation of results. However, as with any computer modelling, the process specification is not straightforward. For instance, there are different ways of abstracting the problem and making judgement for appropriate assumptions.

(a) Simulation software

The energy software in the market ranges from simple to detailed. Selecting a program for a particular job requires matching the tool to the task. Usually, building designers will select a software based on their own experience or expert advice, type of features to model, required level of detail, and contract requirements.

At present, users must rely on the verification provided by the software developers or large independent bodies. Even if the program is regarded as verified, questions may still arise concerning the validity of results obtained by users who are not familiar with the program.

(b) Reference building

Definition of reference building can be a controversial matter. In principle, the reference building and the proposed building shall have the same energy sources, geometry, floor area, exterior design conditions, occupancy, thermal data, etc. The only difference is that the reference building is designed with its envelope, building elements and energy-consuming systems conforming to the prescriptive requirements for these building components.

The reference building is intended to assure neutrality with respect to choices of architectural design, HVAC system, etc. To make the analysis comparable, the procedure commonly adopted is to set up first the simulation input of the design building and then modify it to form the reference building. For those parameters which have not been specified in the prescriptive codes, sound professional judgements are needed to define the modelling assumptions.

(c) Modelling assumptions

Building simulation relies on the users to make reasonable modelling assumptions such as operating schedules, internal loads, etc. The performance-based codes will offer some suggestions, but it is impossible to cover every possible functions and design parameters. Some situations will require special considerations. To avoid cheating, no trade-offs shall be given to those issues which cannot be clearly defined or spelt out, i.e., the issue shall be set out in exactly the same way for the design and reference buildings.

Simulation Skills

To conduct the simulation properly, the aims of the study and the limitations of simulation tool must be fully understood. There are many opportunities for an unwary user to make significant errors e.g. in problem definition and key assumptions. Therefore, proper guidance and quality control are essential. There are three important factors affecting the use of building energy simulation.

(a) Complexity

Building energy simulation requires a large amount of detail for input and will produce a lot of data in its output. The inherent complexity of the simulation process often distances the user from a clear appreciation of the underlying issues and physical processes. When the users become overwhelmed by specific aspects, they tend to lose sight of the overall objective and interrelationships within the procedure.

There is no easy way out when dealing with a complex simulation model. If the situation allows, for example during early design stages, a less complicated simulation program can be used as the first evaluation tool to establish the information. Hopefully, the data could be extended later for use in detailed simulation programs.

(b) Accuracy

Because of the complex and lengthy computational procedures, step-by-step verification of simulation results is impractical. In most cases the program accuracy has to be taken on trust. In many other fields, such as economic forecasting, models are openly accepted as approximations of reality. If they consistently produce results which are meaningful and useful, and whose interpretation is vindicated by the resultant designs, then whether or not they have been subject to technical validation is irrelevant. It should be noted that the accuracy level changes as a function of the quality of design information supplied. If the accuracy of input data is inferior to the quality of the simulation model, then improving the model alone will not reduce the uncertainties.

In performance-based codes, only a comparative study is needed for the designed and reference buildings. For most cases, absolute accuracy of each calculation is not very critical. As long as the assumptions of the two buildings are consistent and the same simulation tool and process are being used, the outcome should be reasonable and acceptable. What is more important will be the assessment of particular trade-off options being proposed.

(c) A matter of validation

In building energy simulation, the meaning of program validation and

verification must be considered in context. It is useful to have validation procedures that address quality control of the energy software. In recent years, standard validation methods for energy software are just appearing, for example:

- the International Energy Agency (IEA) building energy simulation test (BESTEST) diagnostic method (Judkoff and Neymark, 1995)
- ASHRAE standard method of test for building energy analysis computer programs (ASHRAE, 2001b)

Both of them are based on a similar concept. The philosophy is to generate a range of results from several programs that are generally accepted as representing the state-of-the-art in whole building energy simulation programs. The validation process can ensure the fidelity of the modelling techniques and give users confidence that the program can accurately predict the building□ s energy consumption and thermal behaviour.

Conclusions

Building energy simulation is a useful tool for building design. Being able to model a new building can help clients achieve optimisation and satisfy the local energy codes. Further demand for building performance simulation is envisaged as new policies and regulations are coming up, such as the European Union (EU) directive on building energy performance. It is essential to equip the skills now so as to ensure competitiveness.

Reference

[1] EMSD. Performance-based Building Energy Code. Electrical and Mechanical Services Department, Hong Kong SAR. (2003)

[2] ASHRAE, 2001a. ANSI/ASHRAE/IESNA Standard 90.1-2001, Energy Standard for Buildings Except Low-rise Residential Buildings, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Atlanta, Georgia.

[3] ASHRAE, 2001b. ANSI/ASHRAE Standard 140-2001, Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Atlanta, Georgia.

[4] Clarke, J. A., 2001. Energy Simulation in Building Design, 2nd ed., Butterworth-Heinemann, Oxford, U.K.

[5] Hui, S. C. M., 1998. Simulation based design tools for energy efficient buildings in Hong Kong, Hong Kong Papers in Design and Development, Vol. 1, 1998, pp. 40-46, Department of Architecture, University of Hong Kong, Hong Kong. (http://web.hku.hk/~cmhui/hkpdd/hkpdd-v1.htm)

[6] Janda, K. B. and Busch, J. F., 1994. Worldwide status of energy standards for buildings, Energy, 19 (1): 27-44.

[7] Judkoff, R. and Neymark., J., 1995. International Energy Agency Building Energy Simulation Test (BESTEST) and Diagnostic Method, National Renewable Energy Laboratory, Golden, Colorado.

[8] Wong, N. H., Lam, K. P. and Feriadi, H., 2000. The use of performance-based simulation tools for building design and evaluation - a Singapore perspective, Building and Environment, 35 (2000): 709-736.

ASHRAE Region XIII Regional Planning Meeting and President-elect Training

***Mr. Raymond Wong**, Regional Chair of Region XIII answered questions from the floor.*

ASHRAE Region XIII Regional Planning Meeting (RPM) and President-elect training were held on 29-30 May 2004.

Hosted by the Hong Kong Chapter, the programme took place at the Royal Garden Hotel, which included historical displays, meetings, workshops and technical sessions. RPM provided a forum to disseminate information pertaining to chapter and regional activities. This meeting was attended by other Chapters, including Singapore, Malaysian, Taiwan, Thailand and Philippine.

What's Presidential Award of Excellence (PAOE)?

The Presidential Award of Excellence (PAOE) is given by Society President in recognition of the chapters that have excelled in chapter activities. Points will be given by Directors and Regional Chairs (DRCs) or Regional Vice Chairs (RVCs) to chapters who work individually on their written measurable goals set at the beginning of the year. DRCs and RVCs can then award a variable number of points based on how well the chapters meet their goals at the end of the year. The PAOE can be revised in response to the input from the motions received at Chapters Regional Conferences (CRC) and the inputs from DRCs, the grassroots committees and individual members.

Our Chapter has a high score over all the years since founding of the Chapter.

Formation of Technical Working Group

Technical Working Groups (TWGs) were formed on Oct 2003. The purpose of establishing various TWGs is to allow the Chapter and its members to actively monitor and participate in the new development related to HVAC&R industry in Hong Kong and worldwide.

The objectives of TWGs are:

- To monitor and follow up development of specific technical issues
- To study and investigate subjects in local context
- To advise the Hong Kong Chapter on technical issues so as to formulate and gather our views on those issues
- To provide a platform for members to express, discuss and exchange information on their respective subjects
- To initiate and recommend the headquarters to further research respective technical subjects

Who may join?

- Open to all members of ASHRAE Hong Kong Chapter (non-members are also welcome)
- Who are proficient in the scope of a respective TWG
- Who are willing to attend meetings on behalf of a respective TWG and are diligent in correspondence and in managing tasks such as reviews of reports or publications
- TWG Chairs shall approve their members' application

How to join?

Email to ***info@ashrae.org.hk***

News from Chapter Programs

HVAC Knowledge Representation

*Chapter President **Mr. Vincent Chu** (right) presented a souvenior to the speaker **Dr. M.K. Yip** (left) to thank for his presentation.*

The technical talk was well attended.

A technical talk, "HVAC Knowledge Representation", was organized by the committee of Chapter Programs on 13 May 2004 at The Hong Kong Polytechnic University. Dr. M.K. Yip, Electrical and Mechanical Services Department, was the invited speaker. He began the talk by introducing different types of HVAC knowledge that were commonly encountered in different stages. The knowledge representation on HVAC installations included IFC2.x, aceXML, oBIX, etc. He then described how these upcoming standards could be applied to the HVAC design, installation, operation and maintenance. He also shared his experience on using these standards during the talk.

News from TEGA

ASHRAE / BSOME Technical Visit - Super Terminal 1, Hong Kong International Airport

On 29 May 2004, a technical function was organised jointly with the Building Services Operation and Maintenance Executives Society (BSOMES) to visit the Super Terminal 1 at Hong Kong International Airport, Chek Lap Kok. It was fully subscribed with 42 ASHRAE and BSOMES members participated.

Group photo taken at Super Terminal 1, Hong Kong International Airport

The Terminal has a Bulk Cargo Refrigeration Centre, a Unitized Cargo Refrigeration Centre and a Container Storage System.

Function was started by a technical presentation by Mr. K. M. Lam Building Services Engineering Manager of the Terminal and followed by a site walk. During which, participants had the opportunity of appreciating the design intent, technical configurations and operation and maintenance challenges of the facilities, which include the refrigeration systems that have a 175-TR cool room operated at 1.7 °C and a 32-TR freezer operated at - 7.8 °C, and also include a fully automated cargo handling system operated 24-hour/365-day being able to handle over 14,000 storage units with an average dwell time of about 15.5 hours.

All participants enjoyed the experience gained from this function and we wish to express our gratitude to Mr K. M. Lam, his colleagues and the Super Terminal I for their warm hospitality.

Chapter's Officers, Governors and Committee Gathering – Retreat and Training

Group photo taken at the Gathering - Retreat and Training.

On 3 July 2004, our Governors organized a training workshop at Hilltop Country Club. The objective of this workshop is to introduce the organization of ASHRAE to new officers and committee members, which helps them to build up their team spirit. This training formed a briefing to kick off the fiscal year 2004/2005 with friendly atmosphere, and allowed us to better understand the chapter's operation and management. During the training, a Management Talk - "The 5-S Practice" was presented by an invited speaker Dr. Sam Ho.

On behalf of all participants, we would like to express gratitude to Dr. Sam Ho for giving this informative talk.

Joint Functions

- ASHRAE-HKC/ HKIE-BSD/ CIBSE-HKB Joint Technical Talk: Benefits of Heat Pumps in Warm and Humid Climates (***25-6-2004***)
- ASHRAE-HKC / CIBSE-HKB / HKIE-BSD / IEE-HK / CIE-HK / BSE-PolyU Joint Technical Workshop on Innovative Lamps and Lighting Technologies (***19-6-2004***)
- ASHRAE-HKC / CIBSE-HKB / HKIE-BSD / HKIE-ELE / BSOMES / IEE-HK / ARCA / HKECA / FSICA Technical Seminar on Enhanced Building Technologies (***15-6-2004 to 18-6-2004***)
- ASHRAE-HKC/ CIBSE-HKB/ HKIE-BSD/ BSE-PolyU Joint Technical Seminar: Recent Developments in Residential Air Conditioning (***9-6-2004***)
- ASHRAE-HKC/ HKIE-BSD/ CIBSE-HKB/ BSOMES Joint Technical Talk: The Troubleshooter in Properties Management - Views from the Building Services Operation & Maintenance Practitioners (***30-4-2004***)
- ASHRAE-HKC/ HKIE-BSD/ CIBSE-HKB Joint Technical Visit: Marley Cooling Tower Manufacturing Plant in Guangzhou (***24-4-2004***)
- ASHRAE-HKC / IHEEM-HKB / HKIE-BSD / CIBSE-HKB Joint Technical Talk: Indoor Air Quality for Hospitals (***29-3-2004***)
- ASHRAE-HKC / CIBSE-HKB / HKIE-BSD / ICE-HK / Law Society of HK / CIArb-HK Technical Seminar on Current Practice and Future Trend of Contract Management, Construction Law and Alternative Dispute Resolution (***20-3-2004***)
- ASHRAE-HKC / HKIE-BSD / CIBSE-HKB Joint Technical Talk: Effective Design of Air Distribution & Air Filtering System with the Aid of Simulated Air Flow Models (***2-3-2004***)

Group photo taken of ***Mr. Herbert Lam***, Speaker ***Mr Allan J Westbury*** and Speaker ***Mr Richard Meskimmon*** (from left to right).

Mr. George Ling (left) presented a souvenior to the speaker ***Mr. Thomas Chan*** (right) to thank for his presentation.

Mr. George Ling (right) presented a souvenior to the speaker ***Mr. Martin Wu*** (left) to thank for his presentation.

Coming Events

Visit our web site for more information : **www.ashrae.org.hk**