



ASHRAE LINK

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

20th Anniversary Dinner



20th Anniversary Dinner of ASHRAE Hong Kong Chapter.

On 5th January 2004, the 20th Anniversary Dinner was successfully celebrated at the Grand Ball Room of Kowloon Shangri-La Hotel. From the year 1984 to 2004, ASHRAE Hong Kong Chapter was founded initially by several ASHRAE members, among the leaders of the HVAC&R industry, in Hong Kong and has become one of the largest Chapters in ASHRAE.

In this joyous occasion, our celebration was shared with different participants. Over 300 guests from overseas, local institutions, governmental departments and universities joined us to have this spectacular event. A series of wonderful photos with our memories in the past twenty years was presented before the dinner. These photos included the Board of Governors (BOG) meetings, our working groups, ASHRAE Nights, Chapter Regional Conferences and some other functions jointly organized with other societies. The dinner



Toast to the guests by the Chapter Officers, Governors, and Committee Chairs on stage.

started with a welcome speech by our president, Mr. Vincent Chu. Our honourable guests, Mr. Raymond Wong - DRC of ASHRAE Region XIII, Ms. Sarah E. Kemp from American Consulate General and Mr. C. O. Synn, Chairman of 20th Anniversary Celebration Organizing Committee also delivered speeches and shared their experience with us. Besides, certificates were presented to our gold, silver and table sponsors for their generous support and participation during the dinner. In addition, entertainments were provided in that evening. All guests participated pleasurably in a table prize game. With harmonious musical instruments, a folk band performed many beautiful love-songs. Sweet-sound music surrounded us throughout the dinner.



Delegates and guests were enchanted by folk band throughout the dinner.



Group photo of 20th Anniversary Celebration Organizing Committee on stage.

Dinner gift - memorable magazine "20 years of ASHRAE Hong Kong Chapter 1984 - 2004" and delicate key-ring.

02

ASHRAE Night 2003/04

ASHRAE 2004 Winter Meeting

03

Leadership Interview

Dr. C. Y. Chu

04

Technical Article

Contributing Factors to the Energy Efficient Buildings in Hong Kong

by Dr. Philip C. H. Yu

07

Corner of YMC

News from TEGA

Chapter Program

08

Joint Functions

Editor's Message

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 reproduced 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

ASHRAE Night 2003/04

The 19th of February 2004 was a great day among ASHRAE members of different generations. We shared our laughs and tears in the last year at that night.

Mr. Vincent T. W. Chu, our chapter president, ringed a bell for the great event before delivering his welcoming speech. The election of the nominating committee was held. There were Dr. Roger Chu, Mr. Edward Tsui, Mr. Rocks Li, Mr. Victor Yiu and Mr. Vicki Poon, who have been contributing themselves to the ASHRAE family. We expect that they will consolidate our great family in the coming year.

The most exciting part of the celebration was an award presentation for the Quality Student Project Campaign organised by the ASHRAE Hong Kong Chapter. This year, the diamond award for degree programmes and for sub-degree programmes went to Miss Alita W. Y. Ho and Mr. K. N. Tam, respectively. Additionally, the Regional Technical Award was given to Mr. Alex W. L. Li and Mr. Kelvin Wong. These awards served as recognition of outstanding projects and research work in the field of heating, refrigerating and air-conditioning engineering.



Group photo of student helpers, Student Activities Chair **Mr. Paco Tang** and Membership Promotion Chair **Mr. C. F. Wong**.

The end of our great celebration came unconsciously. There were three great ladies, Ms. Eagle Mo, Ms. Gambi Chiang and Ms. Eunice Tong, who ended tonight's celebration by sharing their experience in the field of engineering through their leisure talk - "Women in Science and Engineering". Their experience provided us a picture of the challenges faced by female engineers in three different generations. We were inspired by their braveness in joining the field of engineering, which has long been dominated by men.

Today, we are pleased to see the growth of our ASHRAE family. We are also glad to see that the field of engineering is open to accept people of different age, gender and with different personal backgrounds. It is also a challenge for ASHRAE, as an international organisation, to promote the spirit of equality opportunity in the field of engineering over the world.

ASHRAE 2004 Winter Meeting

The ASHRAE 2004 Winter Meeting was held on 24-28th January at the Anaheim Convention Center, Anaheim, Calif.. Our chapter members, Dr. C.Y. Chu, Mr. Vincent Tse, Mr. W.K. Pau and Mr. Spencer Lo, attended this meeting to exchange their views on the latest development of ASHRAE with other Chapters Officers.

Over 100 sessions took place. The technical program comprised 63 seminars (presentations on a central or related topic with no published papers), 11 symposia (presentations with papers on a central subject), 24 open-discussion fora, one technical session (paper presentations), a poster session and a public session. 66 papers were presented in total.



ASHRAE Night 2003/04.



Group photo of speakers, officers, Governors, and organizing committee.



The speakers **Ms. Eagle Mo**, **Ms. Gambi Chiang** and **Ms. Eunice Tong** (From right to left).



Region XIII dinner gathering in Anaheim. **Professor WU Yuanwei** with his wife (from Beijing, China) and representatives from Hong Kong, Malaysia, Singapore and Taiwan Chapters.

Leadership Interview with Dr. C. Y. Chu

Dr. Chun-ying CHU, has been elevated to the grade of Fellow at ASHRAE's 2003 Winter Meeting in Chicago, Illinois on 25 January, 2003. He obtained his PhD in Mechanical Engineering from Cranfield Institute of Technology, U.K. in 1983. He is also the Fellow Member of HKIE.

His interests include thermal insulation and solar-powered air-conditioning system for which he had received the research grants from SERC(UK) in 1979 and the Croucher Foundation (HK) in 1986 respectively. His research work had focused on the use of Solar Energy for hot water supply systems, integration of solar power driven lithium bromide two-stage absorption chiller. The system included three types of medium temperature solar collectors. Recently, his career has centered on designing the CADD management software.

Q1. You have worked as a mechanical engineer for a long time. Do you have any special affection for Mechanical Engineering?

My father was a mechanic 70 years ago. At the beginning, he earned living by repairing the cinematographers for cinemas. Then, he worked as maintenance mechanic of rice-mill machines in New Territories in Hong Kong half century ago. He inspired me to get into the field of Mechanical Engineering. So does my daughter...?

Q2. You were working in the Mechanical Engineering Department in the Hong Kong Polytechnic (the former of The Hong Kong Polytechnic University) for many years. What are the reasons that you decided to run your own business?

I had several years of HVAC contracting and industrial experience before I took up the teaching post at the Hong Kong Polytechnic University (then Hong Kong Polytechnic) in 1983. My earlier working experience pulled me back to the air-conditioning sector when middle-aged career syndrome drew near in 1995.

Q3. You contributed to editing eight books about the theory of air-conditioning and refrigeration when you were a lecturer in the HK Polytechnic. These books are well-known as a HVAC&R bible for all engineers. Would you mind sharing your happiness and sadness with us during the preparation of these books?

It is my honor to be invited by Mr. S.K. Wang as text reviewer I had to say that Mr. Wang is a great author and maintains high professional ethics. Part of my duty was to avoid printing errors.



Dr. Chu received the fellowship award (a plaque with a mounted medallion) from Dr. Donald G. Colliver, ASHRAE President.



Dr. Chu (on the left) and Jacob Yiu.

Q4. You accomplished significant success on both the academic and engineering fields. What are your keys to this success?

I believe I am quite fortunate. Few words are always kept at the back of my mind - I have many good teachers and friends with me and they never leave me alone...

Q5. What are the reasons that you join ASHRAE? Can you share your feelings about this big family with us?

ASHRAE provides me a lot of knowledge through studies of monthly journals and handbook each year. Also, the Hong Kong Chapter's committee members are working together closely as a football team.

They also promote ASHRAE businesses in Hong Kong successfully every year, say HVAC workshops, short courses, seminars, forums, quality student project campaigns, young members' activities, etc.. In fact, Late Dr. Edwin Tao had stimulated us to make every effort to carry on this unique culture which is gradually formed and exists in the Chapter. All of these keep me associated with ASHRAE for the past twenty-five years.

Q6. You have devoted a lot of time and efforts to the committee of ASHRAE HK Chapter. What is your motivation for this?

We have to encourage our 3rd and 4th generation to climb up the ladder and offer young members to participate the works and meetings with us in the Chapter. We are definite to appreciate their contributions and support student branches as well.

Q7. What are the things you feel most proud of in ASHRAE? What is the biggest challenge? What events or things you most memorized?

I was proud of taking up the Presidency of ASHRAE Hong Kong Chapter in Society year 1994-95. I was made the General Chair of the 2nd Chapter Regional Conference of Region XIII (2nd Region XIII CRC) held on 27 & 28 August, 1999 in Hong Kong.

I am glad that I was elected as Regional Vice Chair (Chapter Programs) of Region XIII for 2001-2004. I have to attend ASHRAE annual/winter meetings and present reports for all six chapters in the region.

I was greatly impressed that I was chosen as Editorial Committee Chair for ASHRAE Hong Kong Chapter 20th Anniversary 1984-

2004 magazine and had published a colorful magazine for the Chapter with the help from all committee members. Finally, I thank all committee members in the past twenty years who have helped me getting through all the works.

Q8. You are so kind and nice to everyone that you can join all age groups of engineers. That's why we can call you using "CHU ZAI" (朱仔). Would you tell us how to develop a successfully social life?

They called me "CHU ZAI". It's because when I joined the Hong Kong Chapter as committee member in 1986 as far as I remembered that I was the youngest among them.

- The Leadership Interview conducted on 8 March 2004.



Contributing Factors to the Energy Efficient Buildings in HK

Dr. Philip C. H. Yu, Member ASHRAE

Introduction

To mark the fifth anniversary of the Hong Kong Energy Efficiency Registration Scheme for Buildings, an experience-sharing seminar was held by the government on 26 November 2003 and was well attended by 250 people. According to the EMSD, about 2% commercial buildings have been successfully registered in 5 years; and the energy savings from the Scheme are estimated to be some 85 million HKD.

It is required to comply with four Building Energy Codes that specify minimum energy efficiency standards in lighting, air-conditioning, electrical and lift-escalator installations. A new Performance-based Building Energy Code was introduced in April 2003 to provide an alternative approach to the Scheme compliance, which focuses on the building's total energy consumption as compared to the energy budget of a hypothetical building.¹ For a typical commercial building in Hong Kong, the energy consumption of the mechanical ventilation and air-conditioning (MVAC) system accounts for 60 to 70 percent of the total building energy use²; and majority of them are using central plant.

Since June 2000, the government is encouraging wider use of water-cooled air-conditioning system (WACS) to improve energy efficiency as well as to save the environment. There are a lot of related consultation studies and implementation pilot schemes undergoing. The territory-wide implementation study report recommended two WACS schemes: Cooling Tower and District Cooling, which would be saving the end-use electricity up to 20% and 35% respectively. The cooling tower scheme, for example, will not only be saving energy but also reducing the carbon dioxide (CO₂) emission from electricity generation. The annual reduction of CO₂ emission per kWh electricity is estimated to be 830,000 tons by 2020, which is equivalent to 2.34% of total CO₂ emission of Hong Kong in 2002.³

This may bring along with a paradigm shift because Hong Kong has been an air-cooling dominant market for years. A water-cooled system can be different in many ways from the air-cooled system that many engineers have been using in Hong Kong. Obviously, a cooling tower is required for heat rejection instead of fin-and-tube air-cooled condenser coil. The extra peripheral equipment may include cooling water pump, water treatment and water piping from cooling tower to chiller, etc. Some design parameters are different, such as wet bulb temperature of outdoor ambient is more important than dry bulb temperature. In WACS, as illustrated by Fig.1, the

power consumption of the whole system is a dependant variable of the chiller, the tower, the pump, and the trade-off relationship among their operation. The coldest entering condenser water temperature (ECWT) is not always energy-saving whereas the optimum ECWT may vary with the outdoor ambient conditions. For chillers, the available technology for better energy efficiency may include selection of the right refrigerant for the right applications, full-load and part-load performance, multi-chiller plant control, etc.

The Right Refrigerant for the Right Applications

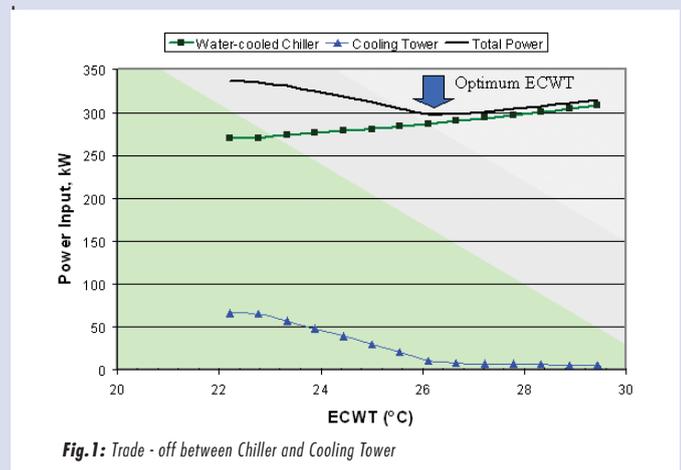


Fig.1: Trade-off between Chiller and Cooling Tower

compliance to Montreal Protocol, the CFC-based refrigerants have been phased out in Hong Kong since 1996. The most commonly used alternative refrigerants for large building air-conditioning applications HFC-134a and HCFC-123 are allowed, approved, or endorsed for use by Environment Australia; Environment Canada; the Japan Ministry of Economy, Trade and Industry; the Japan Ministry of the Environment; the U.S. Environmental Protection Agency; and most other environment ministries worldwide.⁴ In the Mainland, the technical requirement of a qualified substitute to Ozone Depleting Substance (ODS) is that the Ozone Depletion Potential (ODP) cannot be higher than 0.11.⁵ HCFC-123 has an ODP value of 0.02 and HFC-134a is zero; therefore, both of them are qualified. However, zero ODP does not necessarily mean NOT depleting the ozone layer. It is because **stratospheric cooling** caused by the green house gas (GHG, e.g. CO₂ and HFC-134a) has the

operation.⁹ Particularly pointed out by the Air-conditioning and Refrigeration Institute (ARI), the equation was derived for a single chiller installation and was based on an average part-load operation; but individual chillers operating with multiple chiller systems are more heavily loaded than single chillers within single chiller systems.¹⁰ In most of the building projects, a high value of IPLV/NPLV does not imply more energy savings because over 80 percent of the chillers are installed in multi-chiller plants. **Fig.5** shows how the chiller loading is affected by the number of chillers in the plant. The more chillers there are in a plant, the more operation is near full-load; and the individual chiller load profile bears little resemblance to the system load profile. Besides, the IPLV/NPLV rating is a function of the entering condenser-water temperature (ECWT) relief schedule based on the interpretation of cataloged cooling-tower performance at part load given the average weather data of 29 cities (in USA). However, neither IPLV nor NPLV takes into account different locations that may have very different condenser-water temperatures. In fact, once installed, the chilled water system's energy consumption is determined by the tradeoff between chiller, tower and pump power as shown in Fig.1. At many part-load conditions, the coldest water temperature possible does not result in optimal system operation.¹¹ Load, ambient conditions and the part-load operating characteristics of the chiller and tower will ultimately determine the optimum ECWT for a given installation. Therefore, the IPLV/NPLV may be good for comparison among different individual equipment under consistent test conditions but would not be a good yardstick for evaluating energy performance, and could be misleading if it is being specified in energy standard. Because of the minimal weighting (0.01) of full-load, some chillers with a good IPLV have very poor full-load efficiency. These chillers may be using variable speed devices that may degrade the full-load performance indeed (see Table 3 for typical example).

To successfully optimize the performance of a multi-chiller plant and deliver the greatest possible energy cost savings, the designer must account for these facts:

- Variables other than the dry bulb temperature of outdoor air for example humidity, solar loads and operation schedules greatly affect cooling loads in commercial and industrial applications.
- System loads and individual chiller loads in multi-chiller plants are distinctly different.
- Changing loads affect cooling-tower operation and entering-condenser water temperatures.

Table 3: Typical example of chiller with low NPLV but more energy - consuming

Operating Data				Chiller A (with VSD) ^b			Chiller B (standard starter)		
Tons	NPLV	Hours	Ton-Hours	NPLV = 0.436			NPLV = 0.448		
	Weighting ^a			kW/ton	kW	kWh	kW/ton	kW	kWh
500	0.01	30	15000	0.682	341	10,230	0.514	257	7,710
375	0.42	1260	472500	0.52	195	245,700	0.448	168	211,680
250	0.45	1350	337500	0.38	95	128,250	0.428	107	144,450
125	0.12	360	45000	0.416	52	18,720	0.536	67	24,120
Total Operating Hours: 3,000				Total kWh: 402,900			Total kWh: 387,960		

^a ARI 550/590 - 1988, *Water Chilling Packages Using the Vapor Compression Cycle*.

^b VSD = variable speed drive

ARI encourages the use of comprehensive analysis tools that reflects the actual weather data, building load profile, number of chillers in use, operational hours, and energy drawn by auxiliaries such as pumps and cooling towers, when calculating the overall chiller plant system efficiency. With advancement of personal computers, there are many choice of the software packages for comprehensive analysis and building modeling. For instance, Trace 600/700, DOE-2 and BLAST are well recognized by ASHRAE Standard 90.1 as well as the Performance-based Building Energy Code of Hong Kong SAR.

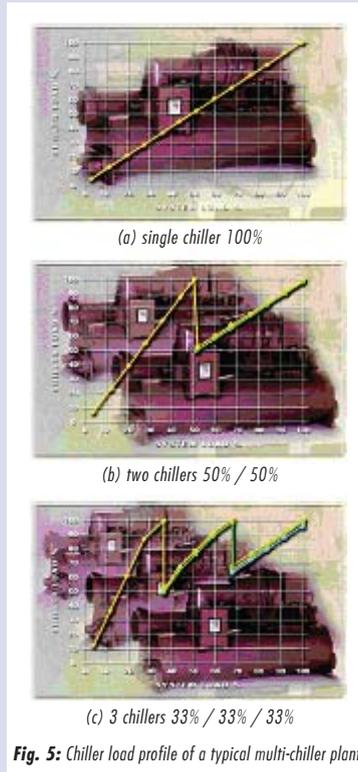


Fig. 5: Chiller load profile of a typical multi-chiller plant.

Conclusions

The Hong Kong government is making effort to promote water-cooled air-conditioning system as a major contributing factor to energy efficient buildings, especially the commercial buildings using central plant.

Chiller technology associated with the selection of refrigerant is critical to improvement of the building energy efficiency. HCFC-123 technology provides the highest efficiency for centrifugal chillers with the lowest annual emission rate. The refrigerant, which has the shortest atmospheric life, very low GWP, very low ODP shall not be undermined. The recent scientific studies for Montreal Protocol recommended a phase-out exemption for HCFC-123.¹² James M. Calm, one of the scientific members of drafting the Montreal Protocol, mentioned at a recent ASHRAE seminar that it was an easy but wrong decision to phase-out all HCFCs including some good ones like HCFC-123; and he believes it will be the long-term alternative refrigerant for centrifugal chillers.¹³ The environmental policy shall be based on a well balance approach taking into account all three aspects of ozone depletion, global warming and energy efficiency (i.e. indirect effect). TEWI analysis is one of the commonly used tools for assessment of total environmental impact.

The minimum energy efficiency requirement for chillers in Hong Kong appears to be the lowest as compared to Shanghai and the USA. The government may consider to raise the standard in matching with the available technology. As mandatory requirement in building energy standard, the equipment full-load performance is far more important than part-load performance. ARI's IPLV/NPLV rating is an indication of the average part-load performance of a single chiller installation and should not be used for evaluating the energy performance of multi-chiller plants. Instead, ARI encourages the use of comprehensive analysis tools such as DOE-2 and TRACE to calculate the overall chiller plant system efficiency.

Reference

- ¹ EMSD. Performance-based Building Energy Code. Electrical and Mechanical Services Department, Hong Kong SAR. (2003)
- ² Yu P C H and Chow W K. Energy use in commercial buildings in Hong Kong, Applied Energy 69, pp.243-255. (2001)
- ³ EMSD. Executive Summary: Territory-wide Implementation Study for water-cooled air-conditioning system in Hong Kong. June 2003.
- ⁴ USEPA. Building Owners Save Money, Save the Earth Replace Your CFC Air Conditioning Chiller. Global Programs Division and Climate Protection Partnerships Division, U.S. Environmental Protection Agency, Washington DC, USA. December 2002.
- ⁵ SEPA of China. HJ21-2000: The Technical Requirement for Environmental Labelling Products ODS Substitute, January 2000.
- ⁶ The Christian Science Monitor, August 2003 Edition.
- ⁷ Baxter V, Fischer S and Sand J R. Global Warming Implications of Replacing Ozone-Depleting Refrigerants. ASHRAE Journal, September 1998, pp.23-30.
- ⁸ ASHRAE. ANSI/ASHRAE/IESNA Standard 90.1-2001: Energy Standard for Buildings except Low-Rise Residential Buildings. ASHRAE, Atlanta, GA, USA. (2001)
- ⁹ ARI. Standard 550/590 1998: Water Chilling Packages Using the Vapor Compression Cycle. Air-conditioning and Refrigeration Institute, Arlington, VA, USA. (1998)
- ¹⁰ ARI. White Paper: Standard for Water Chilling Packages Using the Vapor Compression Cycle. [online; cited Dec.27, 2003]. <http://www.ari.org/wp/>.
- ¹¹ Trane. Tower Water Temperature& Control It How???. Engineers Newsletter, Vol.24, No.1, 1995.
- ¹² UNEP. Montreal Protocol on substances that deplet the ozone layer 2002 Assessment Report of the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee. UNEP Nairobi, Ozone Secretariat, Kenya. January 2003.
- ¹³ Calm J M. Responsible Response to Refrigerant Regulation. Engineered Systems, 20(10):66-72, October 2003.

Corner of YMC

ASHRAE - HKC/CIBSE - HKB/HKIE YMC 1st Joint Gathering

On 14th January 2004, the Young Member Committees (YMC) of three different professional societies including ASHRAE - HKC, CIBSE - HKB and HKIE had jointly organized a gathering at Club House, Laguna City Phase I.

The major purpose of this gathering was to enhance our communication among YMC members. In order to well organize this event, an organization committee was formed among three YMCs to prepare games, foods & beverages and gifts.

More than 30 persons participated in this gathering. The theme of gathering was "Back to School". Everybody had to wear his/her school uniform at that night.

We jumped for not only joy in this event, but also had a chance to work with various YMC members, we believed we have gained valuable and unforgettable experience.



Group photo of HKIE, CIBSE-HKB and ASHRAE - HKC YMC Members.

News from TEGA

Technical Visit to Binary Ice System at Lei Yu Mun Holiday Camp

On 21st February 2004, 40 members of ASHRAE and BSOMES visited the Binary Ice System installed in Lei Yu Mun (LYM) Holiday Camp.

Before the visit, Dr. Arthur Wong, Training Manager of EMSD and Mr. Frankie Lai of EMSD gave a short presentation on the background of the system and on their technical visit of the system in Germany and England. The presentation was finished with a fruitful Q&A session.



Speakers **Dr. Arthur Wong** and **Mr. Frankie Lai** gave a short presentation on the background of the system.

At Lei Yu Man Holiday Camp, the binary ice system consisted of an icemaker, an ice pump, an agitator and an ice concentration meter etc. It was used to provide ice

slurry to the FCUs at the Patron and Staff Canteen with a total area of 514 m². Participants were provided with a chance to feel and inspect a bucket of ice slurry taken from the slurry ice tank.

On behalf of all participants, I would like to express my gratitude to the representatives of EMSD for their kind assistance in arranging this visit.



Group photo taken at Lei Yu Mun Holiday Camp.

Chapter Program

- ▶ Technical Seminar: Options and Outlooks for Chiller Refrigerants (27.10.2003)



The technical workshop was very well attended.



Group photo taken of **Dr. Philip Yu**, **Mr. Edward Chan**, speaker **Mr. Jim Calm**, **Mr. K. L. Chan**, **Dr. Daniel Chan** and **Mr. Edward Tsui** (from left to right).

- ▶ Technical Visit: TVB City in Tseung Kwan O (22.11.2003)



Group photo taken at the entrance of TVB City.

- ▶ Technical Seminar: Introduction to Hygienic Standard for Ventilation and Air-conditioning System (5.11.2003)



Speaker answering questions from the floor.



Mr. Vincent Chu, Chapter President, presented a souvenir to the speaker **Mr. James M. Calm** to thank for his presentation.

- ▶ Technical Visit: Chiller Plant & New Cooling tower Plant in Festival Walk (25.10.2003)



Group photo taken in new cooling tower plant.

Joint Functions

- ▶ HKIE-BSD/ASHRAE-HKC/CIBSE-HKB Joint Technical Talk & Visit: Familiarization of Cable Standards and Application of Various Types of Cable (28. 2. 2004)
- ▶ IEE-SSP/HKIE-EED/HKIE-BSD/CIBSE-HKB/ASHRAE-HKC One Day Technical Workshop on "SYSTEM SOLUTIONS FOR HARMONICS AND EMF/EMI/EMC" (20. 2. 2004)
- ▶ IEE-SSP/CIBSE-HKB/HKIE-BSD/HKIE-ELLD/ASHRAE-HKC Joint Technical Talk: The New Code of Practice for the Electricity (Wiring) Regulations (13. 2. 2004)
- ▶ HKIE-BSD/ASHRAE-HKC/CIBSE-HKB Joint Technical Visit: Two IFC Building (7. 2. 2004)
- ▶ Technical Talk and Visit: Maintenance Strategy for H.K. International Airport at Chap Lap Kok (10. 1. 2003)
- ▶ HKIE-BSD/ASHRAE-HKC/CIBSE-HKB Joint Technical Talk: "We can do better using the Value Approach" (16. 12. 2003)
- ▶ HKIE - CA Division Technical Talk on Building Automation - Open Protocol BACnet (Co-organiser: ASHRAE Hong Kong Chapter) (8. 12. 2003)
- ▶ HKIE-BSD/ASHRAE-HKC/CIBSE-HKB Joint Technical Visit: KCRC Kam Tin Depot (3. 12. 2003)
- ▶ CIBSE HKB/SSP of IEE HKB/HKIE BSD/HKIE ELLD/ASHRAE HKC Joint Technical Talk: Green Approach to Electrical Transmission Substation Design and Implementation (24. 11. 2003)
- ▶ Two Days Short Course on China's National Building Services and Building Energy Standards/Regulations and Professional Practice (21. 11. 2003 to 22.11. 2003)
- ▶ ASHRAE - HKC / HKIE - BSD / CIBSE - HKB / Poly U - BSE / EMSD - EEO ASIA Pacific Conference APC 2003 (18. 11. 2003 to 19. 11. 2003)
- ▶ Society President Richard Rooley's and Region XIII Chair Raymond Wong's Courtesy Visit to HKIE
- ▶ HKIE - BSD / ASHRAE - HKC / CIBSE - HKB / Poly U - BSE Mainland-Hong Kong Joint Symposium 2003: New Technology for Better Built Environment, Qingdao, China (17. 10. 2003 to 19. 10. 2003)



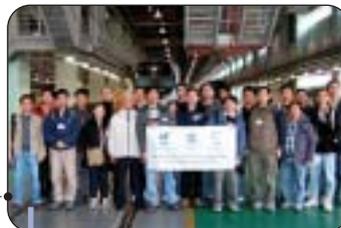
Souvenir presentation by **Mr. Thomas Chan** (centre) to speakers **Mr. Y. M. Chan** (right) and **Mr. Y. W. Ho** (left).



Group photo taken on 88-floor in 2 IFC office tower.



Group photo taken of **Mr. C. F. Wong** (HKIE-CA) speaker **Mr. Douglas Chan**, speaker **Mr. Raymond Rae**, and **Mr. Edward Tsui** (ASHRAE-HKC) (from left to right).



Group photo taken in front of KCRC depot.



Group photo of organizing committee on the stage.



Group photo taken at the visit to HKIE Headquarters.



Group photo of ASHRAE - HKC's representative on the stage.



HKIE President **Dr. Alex Chan** invited our Society President **Mr. Richard Rooley** to sign their autograph album.

Editor's Message

ASHRAE Link has been reported the growth of our Chapter for 12 years. Every ASHRAE Link presents a remarkable snapshot of our Chapter's activities. We think we have a responsibility to ensure that you are enjoyable to the contents inside every ASHRAE Link. Indeed, we continuously enrich the contents of each ASHRAE Link and make it more readable. That's why ASHRAE Link has been changed from a mono-colour copy to a full-colour copy and from four pages to eight pages.

To mark the 12th anniversary of the publication of ASHRAE Link, we are indebted to persons who give valuable and constructive advice on this Link, including our Chapter members, Board of Governors (BoGs) and Officers. Special thanks also go to the past Chairs of the Publication and Newsletter Committee, including Dr. Daniel W.T. Chan, Mr. T.K. Chan, Dr. Sam C.M. Hui and Mr. Rocks Li. They all made a significant contribution to the development of ASHRAE Link.

In connection with the 20th anniversary of Hong Kong Chapter, there is a novel design for the masthead and layout of this ASHRAE Link. I hope you will find it readable.

Jacob Yiu

Chair

Publication and Newsletter Committee

Coming Events

Visit our web site for more information:

www.ashrae.org.hk