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## Message from the President

Dear member,

1 July 2003 is an important date for Hong Kong. We heard a strong voice from the people of Hong Kong. Irrespective of different demands among the people, the ultimate goal of all the people is the same – a better Hong Kong. This is an extraordinary start of the fiscal year 2003-04 as well as the start of my office as the President of the Hong Kong Chapter.



I am happy to inform you that this is the 20<sup>th</sup> anniversary of the Hong Kong Chapter. We have planned a series of event to celebrate our 20<sup>th</sup> anniversary including technical functions, social events as well as recreational events. A celebration dinner for the 20<sup>th</sup> anniversary is scheduled for 5 January 2004 at the Kowloon Shangri-la Hotel. At the start of a new year, the celebration dinner brings together distinguished guests, fellow members and friends to enjoy an evening sharing the wonderful memories of the past 20 years of the Hong Kong Chapter, and to look ahead to the future. Your participation will add further unforgettable memories to us. Other recreational activities will also follow including a Family Day in November this year to let us enjoy the breeze of autumn together with our family members, and a soccer tournament in spring next year.

Technical seminars, workshops and visits are already planned and some have already been conducted, to provide continuing education and update of latest engineering technologies. Our exposure in this year will escalate to an international level. We are honored to host the 7<sup>th</sup> Asia Pacific Conference entitled "Innovations and Integrated Building Performance" on 19-20 November 2003 in collaboration with the HKIE BS Division, CIBSE HK Branch, Department of BSE of the HK Polytechnic University, and Energy Efficiency Office of the EMSD. Speakers from different countries will present their papers and exchange opinions on this subject. It is also our great honor to have ASHRAE President, Mr. Richard Rooley, come to Hong Kong as a keynote speaker for the event. Members should not miss this chance to meet the first ASHRAE President residing outside USA. Our feet also step out from Hong Kong to the Mainland China. A Joint Symposium with HKIE BS Division and CIBSE HK Branch and our China counter parts will be held at Qingdao on 17-18 October 2003. With more closer tie and more economic activities with the Mainland China, this event serves as a vehicle for experience exchange between the two areas.

Hong Kong Chapter is always an active member of the Region 13 of ASHRAE. We have been supporting various Regional events since its establishment. The 6<sup>th</sup> Chapters Regional Conference has just been held in 19-20 September 2003 in Bangkok hosted by the ASHRAE Thailand Chapter. 18 representatives from the Hong Kong Chapter attended this event which provided a great chance for the members from the 6 Chapters within the Region to meet together to exchange opinions and learn from each other on chapter operation.

In this year, we strive to improve our communication with members, and to encouraging members' participation in the Chapter activities. First of all, an electronic newsletter was launched in September, which is a monthly issue with a brief and modern outlook to provide a convenient and handy source of information for members. We also seek opportunities for members to contribute their knowledge and know-how to help others or the Society. We are considering to set up Focus Groups on special subjects to provide a platform for members to exchange information, follow up development in specific subjects like energy efficiency, Indoor Air Quality, etc., or even to research in their interested subjects. I hope that the outcome from these Focus Groups will not only help the members, but also the community.

As mentioned earlier, Hong Kong Chapter has been with us for 20 years. We are amazed by the fast development of the Hong Kong Chapter in two decades time. Being part of the Chapter, we are proud of it. Looking ahead, I hope you would join me to build a bigger Hong Kong Chapter as well as a better Hong Kong.

Vincent Chu

President, Hong Kong Chapter 2003-04

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## **The 6<sup>th</sup> Chapters Regional Conference (CRC)**

The 6th CRC of ASHRAE Region XIII was successfully held on 19 - 20 September 2003 in Bangkok, Thailand. At present, the ASHRAE Region XIII consisted of six chapters in Asian countries, including Malaysia, Philippines, Singapore, Taiwan, Thailand and Hong Kong. The objectives of this CRC were to provide an opportunity for HVAC&R professions and specialists in different regions to exchange their technical knowledge, and to allow the society officers and staff to present their views on the latest development and improvement plans of ASHRAE chapters.

To begin with, Dr. H.E. Prommin Lertsuridej, Minister of Energy, the Government of Thailand, gave an opening address and keynote speech on the importance of a sustainable design concept and how this interacted with our society, economy and environment. During the CRC, two technical seminars were well-received by participants. The title of the first seminar was "15 Years of Thailand Experiences on the Implementation of Energy Conservation Act", which was chaired by Prof. Tawee Vechaphutt, BOG, ASHRAE Thailand Chapter. Within this seminar, three specialists expressed their views on how to apply new HVAC&R technologies, energy strategies and codes, and a shift in system design in their country. In the second seminar, William J. Coad, ASHRAE Distinguished Lecturer and ASHRAE President in 2001-02, discussed the issue in "The Ethics and the Economics of Energy Conservation". Within the CRC, there were six committee workshops to allow chapter officers to share their experience in managing their chapters and in organizing CRCs in different regions. The officers actively participated in these workshops and brought valuable discussion on a wide range of topics, including membership promotion, student activities, chapter programs, TEGA and refrigeration, the development of historian/newsletter/webpage and resource promotion. Our chapter was an honour to receiving many awards at the CRC. These were ASHRAE Region Chapter Program Award, PAOE Honor Roll 2002-03, Highest Points Level 4 in various working committees (History, Chapter Operation, TEGA, Chapter Programs, Student Activities, Membership Promotion and Resource Promotion) and Special Citation. Different personal awards were presented to our chapter officers, including Dr. Mr. Raymond Yau (Presidential Award of Excellence), Mr. Wong Chun Fai (Top of Top Five: PAOE), Mr. Alex W. L. Li (ASHRAE Regional Technology Award) and Mr. Kelvin K W Wong (ASHRAE Regional Technology Award).

The Singapore Chapter will host the 7th CRC of ASHRAE Region XIII, which will be held on 20 - 21 August 2004 in Singapore. Details of this will be announced later.



*Officers, Committee Members and members of ASHRAE HK Chapter at the Meeting of CRC Region XIII*



*Awards received from the Society at the Meeting of CRC Region XIII*

## **1. How did you join the engineering sector?**

I was born with a fair bit of curiosity and creativity, and a lack of interest in things that require a lot of effort in memorizing things. The economical and social environments around me in the 50's to the 70's do not offer as many varieties as today, and engineering was a readily accessible profession wherein I could express myself quite effectively and make a living at the same time.

## **2. Would you explain “The SPIRIT of Hong Kong” that you said in various events?**

I have a passion to contribute to the society in a broader way beyond engineering. SoHK (The SPIRIT of Hong Kong) is a project designed to *Empower People to Consciously Create the Future of Hong Kong Together*. Like ASHRAE, this project is volunteer-based. It has been planned for over two years by professionals from many disciplines, and will be launched by the end of year 2003. More details are available in the website [www.spiritofhongkong.org](http://www.spiritofhongkong.org).

## **3. What is your feeling about the change in E & M services in Hong Kong in recent decades? What is the position of E & M services in society in the future?**

Two some decades ago, when the economic structure of the building business was in a healthier equilibrium, the E&M sector had more opportunities to exercise what was then the state-of-the-art engineering. When the property market goes into craze, the weight of the E&M services, which are all *not-to-be-seen* in nature, become much lighter. This was/is the most important primary force which pushes the professionalism of the trade to fall farther and farther behind the frontier of the world. If not remedied, it will eventually bring the professionalism, the value, and the status of our trade down the spiral into the drain. It is entirely our own responsibility to break this vicious circle and bring to the building business a new formula which enables our trade to *Create and Share Added Value* to the building business and hence to the world.

## **4. What are your suggestions on the orientation of young engineers?**

Young engineers are now often encouraged to take up Mainland China related jobs. To succeed in such pursuits, the most important ingredient to acquire/enrich is *International Context*. Unsurprisingly, this ingredient is also very important for getting jobs in Hong Kong as well as anywhere outside of HK. *International Context* has been the major difference that has been making Hong Kong people standing out from neighbouring areas. Once we allow this advantage to disappear, our handicap in other areas will not be helpful to keep us afloat.

## **5. What are your achievements being a member of ASHRAE? What is your advice on the ASHRAE Hong Kong Chapter?**

I joined ASHRAE in year 1976 as an Associate Member. I started to serve Hong Kong Chapter as Program Chair at the invitation of Vincent Tse, one of our early Chapter Presidents and our DRC of the last term; that was year 1988 when the Chapter was still in its juvenile stage. When I served as Chapter President in year 1993, inspired by my daughter growing into adolescence, I have decided to prepare the chapter for the same. So, I advocated to operate our chapter with strong reference to the MCO and instilled the China Relations Committee, the Institution Liaison Committee, the Publicity Committee, the Historian, and a technical presentation to increase AGM attendance which at that era was only about 6 or 7 members. I am very glad that these have served its purposes very well. Today, the chapter has grown into one of the biggest and matured chapters of ASHRAE worldwide. It is equivalent to a good medium sized enterprise. External environment has also greatly evolved. Managing volunteered manpower of such a scale is beyond merely doing proportionally more of the same. A close analogy is the difference between the captain of an ocean liner and a coxswain.

## **6. We all know that you contribute so much to the establishment of ASHRAE Region XIII. What do you think of the impacts of ASHRAE Region XIII since it operates for several years?**

My strong visibility at the conception and early after-birth stage of the Region may have led people to think that I was a major contributor. The truth is, most of the key missions were accomplished by the numerous members from our chapter as well as Taiwan, Singapore, and Malaysia chapters, who graciously took on roles that are less visible. We must also not forget the tremendous support from friends outside of our Region. Those are friends from other Regions and from the headquarters that we have made over the years in ASHRAE meetings in USA. Region XIII creates and facilitates two-way contributions between Members and Society. The Region serves the Society by substantially strengthening the presence and status of ASHRAE in the region, and by delivering abundant input to the Society; both contributing to fulfilling ASHRAE's Vision and Mission. The Region also serves to direct the Society to deliver better service to its members in the Region. I have spoken about the importance of *International Context*. The CRC and the Regional positions are excellent opportunities for our members to nurture and to keep up that outstanding difference.

**7. The ASHRAE Hong Kong Chapter recently intends to use some new management techniques such as “Six Thinking Hats” and “Robert’s Rules of Order”, what are your opinions on this? Which technique do you think is better?**

Both are excellent and useful tools serving very different purposes. STH is for synergizing the combined brainpower of a group for creating and harvesting the “best solutions” possible from that group. RRO is about recognizing, respecting, and excising the rights of the individuals and of the group so that decisions so made are the least disputable. Use both of them to serve the group, and never direct the group to serve either one of them.



*Mr. W.K. Wong shares precious materials of the history of the Society to the editor during the leadership interview conducting in Fringe Club Central*



*Photo taken of Mr. W.K. Wong (standing in second from left), his friends of the Spirit of Hong Kong (SoHK), and the editor Mr. Jacob Yiu (standing in third from left) after the leadership interview*

**Optimal Static Pressure Reset in Variable Air Volume Air Conditioning System**

**News from  
TEGA**

Traditional design and operation of a VAV system works by keeping the supply air duct pressure constant while adjusting the damper of the VAV boxes to control the flow rate of supply air. A new concept has been developed in recent years that the static pressure changes automatically according to the changing cooling load. This allows the static pressure to reduce to an optimal level, and hence energy saving can be achieved in AHU fans equipped with variable speed drives.

A new control strategy was designed and developed from scratch to suit the operation in an existing building “Cityplaza One”. This project lasted for 8 months, including the design, development, installation, testing and commissioning. The whole VAV system of the building was also re-commissioned to ensure every

component was functioning.

The investment cost of this project includes Building Management System upgrading and a software installation. The payback period of this project is 4 months.

Significant benefits of this project are as below:

- Annual energy saving of HK\$260,000;
- Improved indoor thermal comfort;
- Reduced nuisance noise in low/no load condition; and
- Automatic fault diagnosis of VAV boxes.

Cityplaza One is probably the first building to have applied this innovative concept in Hong Kong.

**DESIGN OF AIR-CONDITIONING SYSTEM FOR SARS WARDS**

**By Yuguo Li and SARS Busters\***

**Technical  
Article**

**Background**

The hospital care workers (HCWs) have been the most severely affected professions during the SARS epidemics in Hong Kong and elsewhere between November 2002 and June 2003. 20% of the infected were HCWs worldwide. 22% of the confirmed cases in Hong Kong were HCWs; which occurred in many hospitals, including the teaching hospitals of the two medical faculties in Hong Kong. Overcrowding in the ward and ventilation systems which were not designed for the handling of SARS were suspected to be contributing factors, although no detailed epidemiological studies were available.

## SARS-Busters' Efforts

The effectiveness of the air conditioning system in existing hospital wards has been a great concern since the SARS outbreak. In response to this concern, the Hong Kong Institution of Engineers formed an expert group in early May - the SARS-Busters to investigate and develop an air-conditioning system that is suitable for SARS wards. A new SARS ward air conditioning design was completed in late May. The new design takes into the major recommendations by the WHO, CDC (US), the Chartered Institution of Building Services Engineers (CIBSE, UK), the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) and local practices for handling of airborne infectious diseases. The new design is well supported by extensive computational fluid dynamics simulations (SARS Busters, 2003) and a full-scale test room study at HKU (Li and SARS Busters, 2003). The main idea of the new design is to minimize air mixing and improve virus removal effectiveness in the SARS wards.

## Complexity of Indoor Air Distribution Design

One difficulty when attempting to design and predict indoor airflow is that there are many factors; which influence or govern the airflow. Quite often some of these factors are difficult to analyse. These factors may be summarised as follows:

1. The geometry of the room, i.e. a deep or a short room, a narrow or a broad room;
2. The type and location of supply air terminals and the location of extract air terminals;
3. Supply air parameters such as velocity, momentum flux and buoyancy flux;
4. The location, shape and buoyancy flux of heat sources;
5. The location of obstacles and furniture;
6. Radiation and heat loss through the walls;
7. Infiltration and exfiltration through door gaps and other leak areas;
8. Movement of equipment and people, etc.

As demonstrated in the SARS-Busters project, both computational fluid dynamics simulations and full-scale test room studies (see Figure 1) are shown to be useful for analysing the air flow patterns and virus-laden aerosols dispersion in hospital wards.



Figure 1. Smoke visualization of the exhaust (A) and supply (B) air streams in the full-scale test room at HKU.

## Design Guidelines

Based on the preliminary results obtained from SARS Busters' study, design guidelines from CDC, WHO and ASHRAE and local practices, the following design principles are recommended for the SARS Ward:

- If possible, single occupancy ward design with a separate air conditioning system is always preferred.
- Negative pressure in the patient room needs to be maintained.
- A minimum of 12 air changes per hour outdoor air supply is recommended.
- Low-level exhaust is preferred together with a ceiling downward supply. For ceiling level supply, the supply air velocity should be maintained between 0.1- 0.3 m/s.
- If space and budget is allowed, dedicated supply grilles for HCWs in the middle corridor region are recommended; and supply and exhaust grilles for patient beds are positioned to minimize cross-infection between beds and between patients and HCWs. Care should also be taken in locating the supply grilles near a patient's bed to avoid cold draught. Ideal locations would include bed ends and between beds.
- The bed-head exhaust is very effective for sleeping patients. This should be promoted if space allows and if hospital infection control has no objection to its position. Other designs such as retractable hoods may also be considered.
- If a bed-head level exhaust is used, a 30 to 70 ratio between the bed-head level and below-bed extraction is

found to be suitable. Noise could be a problem if exhaust grille air velocity is too high.

- The ventilation system designed by SARS Busters appears to provide good contamination control for HCWs and the opposite patient beds. Adjacent patient bed is not as well protected. It is recommended to always put patients in opposite beds first.
- Air distribution in SARS wards is shown to be a complicated turbulent process and proper design using computational fluid dynamics simulations, laboratory testing or even field mock-up is considered to be very important.
- Testing and commissioning is critical. Apart from the conventional items such as flow balancing etc, testing and balancing should include a check of supply air streams, which can be easily done by using smoke visualization.

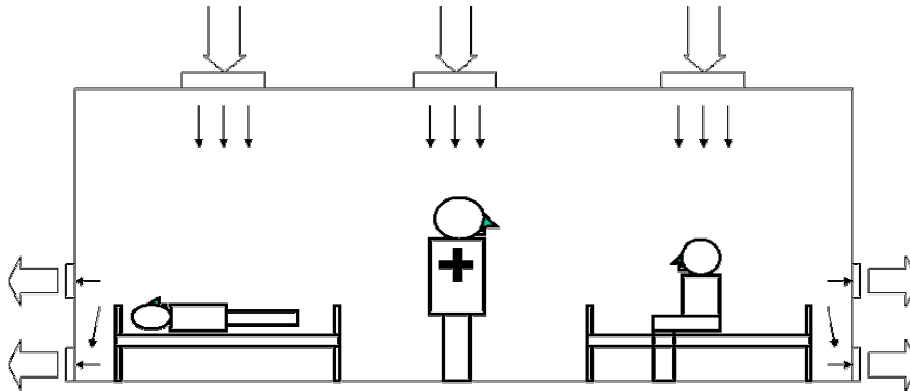


Figure 2. A schematic diagram of the basic air flow design by SARS Busters (2003).

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2. Center for Disease Control and Prevention: Guidelines for preventing transmission of Mycobacterium tuberculosis in health-care settings. Morbidity Mortality Weekly Report 43 (RR-13), 1994.
3. CDC: SARS Infection Control and Exposure Management. <http://www.cdc.gov/ncidod/sars/ic.htm>, Last accessed, 18 September 2003.
4. SARS Busters: Air-conditioning System for Hospitals dealing with SARS. To appear in HKIE Transactions, 2003.
5. Li, Y. and SARS-Busters: Experimental investigation of the SARS busters' new air-conditioning system for SARS wards. To be presented in Asia Pacific Conference on Built Environment, Hong Kong, 18-19 November, 2003.
6. WHO: Hospital Infection Control Guidance for Severe Acute Respiratory Syndrome (SARS), <http://www.who.int/csr/sars/infectioncontrol/en/>, Last accessed, 18 September 2003.

#### Information About SARS Research

WHO: <http://www.who.int/csr/sars/>

CDC: <http://www.cdc.gov/ncidod/sars/>

HKU: [http://www.hku.hk/sars/medical-info/Research\\_Pub.htm](http://www.hku.hk/sars/medical-info/Research_Pub.htm)

SARS Reference: <http://www.sarsreference.com>

\* The SARS-Busters is a team of professional engineers from the Hong Kong Institution of Engineers, the University of Hong Kong, Chinese University of Hong Kong, the Chartered Institution of Building Services Engineers, UK (HK Branch), the American Society of Heating, Refrigerating and Air-Conditioning Engineers (HK Chapter), Building Services Operation and Maintenance Executives Society and the Hong Kong Air Conditioning and Refrigeration Association.



Dr. Yuguo Li (Right) presented the full-scale test room to Ir. Dr. The Hon. Raymond Ho, Representative of the Engineering Functional Constituency of the Legislative Council and Mr C. W. Tse, Principal Assistant Secretary (Environment) of the ETW Bureau

## Six Thinking Hats Workshop

On 5 July 2003, the Chapter Program organized a Six Thinking Hats workshop at Hilltop Country Club in Lo Wai. This workshop had more than 20 participants and was presented by Ms. Diane Wilcoxson, who is currently a professional training facilitator of Diane Wilcoxson & Associates Ltd. In this workshop, Ms. Diane provided a training course on the use of Edward de Bono's Six Thinking Hats method to foster collaborative thinking & interaction, to promote different ways of thinking, to create an open and creative climate for discussion, to reduce an adversarial approach in all interactions, and to run more effective meetings in order to improve the Chapter operation

Six Thinking Hats are a good technique to look at the effects of a decision from different points of view. They allow necessary emotion and skepticism to be brought into what would be purely rational decisions. They open up the opportunity for creativity within decision-making. The technique also helps, for example, persistently pessimistic people to be positive and creative.

On behalf of all participants, we would like to express gratitude to Ms. Diane Wilcoxson for giving this informative workshop.



*Group Photo in Six Thinking Hats Workshop*

## Technical Visit to SARS Test Chamber in HKU

A technical visit to a SARS Test Chamber in HKU Yam Pak Building, which was organized by the Chapter Program, took place on 26 July 2003. The visit coordinator introduced a full-scale mock up test chamber for SARS wards to investigate the performance of a new air conditioning system designed by SARS-Busters. The full-scale test room had a dimension equivalent to a typical ward in HK. The new test room was designed with some degree of flexibility, which could be used for testing other hospital rooms such as ICUs, fever wards and single occupancy SARS wards, etc. During the visit, participants learned the background & history of the test chamber, its system design and simulation, the demonstration of an air flow experiment and research experience achieved by the SARS-Busters

and the HKU team.



*Group Photo in Technical Visit SARS Test Chamber*

## Technical Visit – Desiccant Dehumidifying Plant

A technical visit to desiccant dehumidifying plant has been held in the Hin Keng Market in Tai Wai on 27 September 2003. A central air-conditioning system has been recently added to the Hin Keng market which was only provided with mechanical ventilation previously. With a view to improving the effectiveness of humidity control, a Desiccant Dehumidification System is installed, which removes the moisture content of all incoming fresh air. The participants visited the central desiccant dehumidification plant, control room, air-cooled chiller plant and market air distribution installations. The fresh air intake is pre-treated by desiccant dehumidifiers and then distributed to different zones of market, which is divided into wet and dry zones. UV air sterilizer and water scrubber are also provided for poultry outlets.

The guided visit was arranged by Dr. Y C Lee and Mr. Vincent Chang of the Hong Kong Housing Department. Technical introduction on desiccant dehumidifier was carried out Dr. Lee and Mr. Cheng, as well as a representative of Town Gas. 20 participants joined the technical visit.



*Group Photo in Technical Visit to Desiccant Dehumidifying Plant*

## Joint Society Function

### Joint Technical Visit: BIPV at Wanchai Tower, HKSAR on 8 August 2003 (HKIE-BSD/ CIBSE-HKB/ ASHRAE-HKC)



Group photo taken at the entrance of Wanchai Tower

### Joint Technical Talk: The Potential of Wider Use of Water-cooled Air-conditioning in HK on 30 September 2003 (HKIE-BSD/ CIBSE-HKB/ ASHRAE-HKC)



Group photo of speakers and the organizing committee

### Half-day Workshop: Professional Liability for Engineers on 20 September 2003 (HKIE-BSD/ CIBSE-HKB/ SSP-IEE-HK/ ASHRAE-HKC)



Mr. Victor Yiu (R), Institutions (HK) Liaison Committee Chair, presented a souvenir to the speaker Mr. Barry Chin (L) to thank for his presentation

### Joint Technical Talk: IAQ Management Programme on 22 September 2003 (HKIE-BSD/ CIBSE-HKB/ EA HKC/ HK-PolyU BSE/ ASHRAE-HKC)



Group photo of speakers and organizing committee on stage

## Driving Range Golf Training Course for Beginners

On 26 July 2003, our Young Member Committee (YMC) and the OGC Golf City jointly organized a driving range golf-training course for young members. The course was held in the OGC Golf City (former Kai Tak Runway). It had more than 20 participants was divided into two sections. The first section was an introduction on the golf equipments, rules and etiquette. The second section was a swing practice on instruction gripping, posture, stance and aiming. All participants felt that the course was very informative and interesting. They all enjoyed the course and had fun with golf playing under the instruction of the professional coaches of the OGC Golf City. Our first YMC function was ended in a sense of happiness. There are still many interesting and innovating functions coming up. We are looking forwards for your participation in our YMC activities!

## News from Young Members Committee



Group Photo in this Training Course

## **Welcome to New Members and Member Upgrade!** (who have been granted membership in July - August 2003)

### Members:

Chan C Edwin	Yiu Chi Man Jacob	Leung Chi F	Lee Ying C	Kwok Wai Lan	Ng CY Jonathan
Lam T Rick	Kong Wai Keung Tony	Law On Shing	Cheung Man Yuen	Yeung Muk	Tsui Sin
Yuen Kam Keung					

### Associate Members:

Janssen Peter      Wong Kin

### Student Members:

Lai Chun Wai      Lam Lok      Chan Wing Yan

## Coming Events

Visit our web site for more information – <http://www.ashrae.org.hk>