

# Philippines Study Tour on HVAC&R Technology 2008

## Report



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## **Forewords**

I believe the Philippines Study Tour this year is very interesting and fruitful. The students from Hong Kong have chance to visit two universities in Philippines (De La Salle University and Mapua Institute of Technology), the Philippines Department of Energy and some engineering projects and companies. I am very pleased to see the ASHRAE Student Branches in Philippines are very active and they are doing many meaningful activities. They have developed technical events as well as social service functions to care about the community. We can feel the joyfulness and enthusiasm of the young people in this country.

As usual, our Hong Kong students have attended the ASHRAE Region XIII Chapters Regional Conference and interacted with the delegates and students from other ASHRAE Chapters. They have met and made friends with the student representatives from Philippines, Malaysia, Singapore, Taiwan and Thailand. I believe the spirit of cultural exchange has enabled them to break many barriers (such as languages and lifestyle) and develop better mutual understanding.

The Study Tour not only provide opportunities for our students to learn technical matters and different cultures, but also offer an excellent platform for them to develop various skills including organization, communication, teamworking and performance. I am particularly impressed by the cultural night performance that our students have done in front of some 200 attendants at the banquet dinner.

I would like to express sincere thanks to the ASHRAE Philippines Chapter, Hong Kong Chapter, all related organizations and people. Without their kind support, the Study Tour would not have been so successful. I hope that the spirit of the study tour will be continued and the participants will extend the findings and experience to benefit themselves, other students and our industry.



Dr. Sam C. M. Hui (Study Tour Advisor)  
ASHRAE Hong Kong Chapter

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## **Executive Summary**



After planned for six months, ten students including me had gone for a seven-day Philippines Study Tour on HVAC&R Technology, which was jointly organized by the University of Hong Kong, the City University of Hong Kong, the Hong Kong Polytechnic University and the Hong Kong University of Science and Technology, from 25<sup>th</sup> August to 31<sup>st</sup> August 2008 in this summer.

The objective of this study tour was to enhance students' interests in HVAC&R technologies by functions of talks, seminars and visits. This seven days study tour was a valuable experience for us to broaden our view by looking into more worldwide technology and engineering industry outside Hong Kong. In these seven days, we joined various activities. While the ASHARE Regional XIII Chapters Regional Conference allowed us to read more engineering stories in the guest sharing sessions by the two professional engineers, the visits to the Concepcion-Carrier Air-conditioning Corporation plant, Philippine Department of Energy and Testing Laboratory and Main Office and 9th International Food and Beverage Exposition 2008 also let us understand the electrical and mechanical background and HVAC technology development of the Philippines.

In spite of acquiring engineering knowledge, the visits of the University and the Institute and the Banquet Dinner also provided us an occasional opportunity to have academic and cultural exchange with students from other countries. These were additional earnings for us to establish friendship with each other in this trip. Moreover, we ten have to give a great thank to the Filipino students for their enthusiastic hosting during the days we were in the Philippines.

This study tour was successful. We finally had to thank for ASHRAE Hong Kong Chapters to support this enjoyable trip in this summer. Hope there will be more students to have chances to participate in and benefit from the activities jointly organized by ASHRAE and Hong Kong universities in the future.

Team Leader

Bill Yu

Philippines Study Tour 2008

## **1. Introduction**

In August 2008, the ASHRAE Region XIII Chapters Regional Conference will be held in Manila, The Philippines. This study tour is arranged to allow the students in Hong Kong to attend the conference and to carry out technical, academic visits and exchanges. Study tours to Malaysia in 2006, Taiwan in 2007 were organized successfully.

The objectives of the study tour are:

- To study the culture and social-economic development of The Philippines
- To enable students to develop knowledge and skills in advanced HVAC&R technology, building environmental design and creative thinking
- To promote international cooperation, cultural exchange and mutual understanding among Asian countries

The participants of the study tour come from three universities including City University of Hong Kong, The University of Hong Kong and The Hong Kong Polytechnic University. Before having the study tour, students had to attend meetings for the preparation works. Through the meetings, students from different universities learnt the importance of teamwork and organization skills. During the study tours, attending professional engineering conferences, technical visits, company visits and sightseeing had broadened students' horizon. In addition, students were able to meet different engineering students from The Philippines, Taiwan, Thailand, Singapore and Malaysia. Cultural values could be exchanged with different student chapters and a better understanding of Asian countries would be developed.

## **2. Itinerary of the Study Tour**

Duration: 25 August 2008 – 31 August 2008

Flight: Philippine Airlines (PR)

Hotel: Orchid Garden Suites Manila

### Day 1 -25 August 2008 (Mon)

Morning: Depart Hong Kong to Manila (Flight: PR301 1100/1315)

### Day 2 -26 August 2008 (Tue)

Morning: Academic visit to DLSU and MAPUA

Afternoon: Visit to Philippine Department of Energy's Lighting and Appliance Testing Laboratory (LATL), Diliman, Quezon City

### Day 3 - 27 August 2008 (Wed)

Morning: Visit to construction site of St. Luke's Medical Center - Fort Bonifacio

Afternoon: Visit to Philippine Department of Energy's main office at the Fort Bonifacio, Taguig City

### Day 4 -28 August 2008 (Thu)

Morning: Visit the 9th International Food and Beverage Exposition 2008

Afternoon: Visit the 9th International Food and Beverage Exposition 2008

### Day 5 - 29 Aug 2008 (Fri)

Morning: Attend CRC Technical Seminars

Afternoon: Plant tour to Concepcion-Carrier Air-conditioning Corp.

Evening: Banquet Dinner (with cultural presentation)

### Day 6 - 30 August 2008 (Sat)

Morning: Student Forum and Campus Tour (DLSU & MAPUA)

Afternoon: Sightseeing – Manila City Tour

Evening: Region XIII informal dinner

### Day 7 - 31 August 2008 (Sun)

Morning: Prepare for departure

Afternoon: Depart Manila to Hong Kong (PR310 1830/2040)

### **3. University Visits**

#### ***3.1 De La Salle University (DLSU)***

De La Salle University is a Catholic private university located in Manila, run by the Brothers of the Christian Schools. It is the oldest campus of De La Salle Philippines, a system composed of 18 Lasallian institutions in the Philippines established in 2006 to replace the De La Salle University System. The university draws inspiration from the life and works of the institution's founder, Saint John Baptist de La Salle. It is the first of only two private universities in the Philippines to earn a Level IV accreditation - the highest possible level - granted by the Philippine Accrediting Association of Schools, Colleges, and Universities (PAASCU).



#### ***3.2 Sinag – Pride of the Filipinos***



There was a great engineering product which was jointly invented by the DLSU and other engineering companies, shown in the DLSU laboratory.

The product was named as Sinag. It proudly carries the Philippine flag. More than a marvel of engineering, it is a result of the synergy between industry and academe dedicated to showcasing the Filipinos' capability in developing solar power as a viable and sustainable source of energy. Designed, built, and ultimately raced by engineering students from De La Salle University – Manila with the assistance of their professors, Sinag crossed the finish line in Adelaide, Australia after 3000 grueling kilometers. Across the punishing environment of the Australian sub-continent, the Challenge tested the Filipinos' skills and fortitude, as well as the quality of solar cells that were proudly made in the Philippines.



Essentially an electrical vehicle, the solar car obtains its energy from solar panels on the car. Cramped and hot from the heat of the solar panels, they have very few comforts compared to a normal car. For maneuverability and safety, the solar car contains features of standard automobiles such as brakes, accelerator, signals, rear view mirrors, ventilation and even cruise control. Two-way radio communication links the solar car with its support crews.



Expectedly, the most important aspect of the solar car is its electrical system. It controls all of the power that the vehicle both generates and utilizes. Its battery pack is its heart. Solar cars use voltages between 84 and 170 volts. The solar car converts sunlight into energy. They are arranged into arrays consisting of hundreds of photovoltaic cells acting like a lot of small batteries hooked in series. The total voltage produced is equivalent to the output of all cell voltages.

Weather is an important determinant of the power produced by a solar array. The position of the sun also determines the total power of the array. At noon, on a bright day, over 2 kilowatts of power can be produced by a good array.

The 2007 Panasonic World Solar Challenge saw 41 international teams competing in different classes. Sinag performed remarkably, needing only minor adjustments to its brake system to quickly jump to 12<sup>th</sup> place over-all. By the time it crossed the finish line in Adelaide, Sinag was ahead of a dozen competitors in its class. For the first-ever entry by a Third World country, the feat was nothing short of phenomenal.

Some of the country's largest corporations accepted the challenge to harness the talents and abilities of the Filipino youth by funding efforts to design, build, and race the first-ever Philippine Solar Challenge. Through the Philippine Solar Car Challenge Society, Inc., Sinag became reality. The Society aims to undertake a viable and continuing program for the study and application of renewable energy sources toward the development of a Philippine program for sustainable utilization of renewable energy.

### **3.3 *Mapúa Institute of Technology (MAPUA)***

Mapúa Institute of Technology (MIT, Mapúa Tech or simply Mapúa) is a private, non-sectarian, Filipino tertiary institute located in Manila. It was founded by Don Tomás Mapúa in 1925. The Institute prides itself with the quality of its architecture and engineering programs which has been demonstrated time and again in the long history of topnotch performance of its graduates in the government-administered professional licensure examinations.



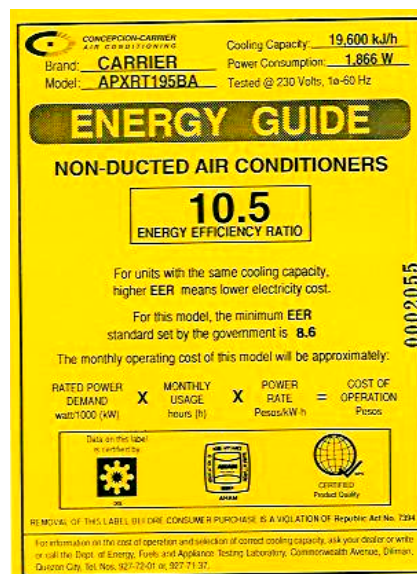
## 4. Visit to Philippines Department of Energy

### 4.1 *Philippine Department of Energy's Lighting and Appliance Testing Laboratory*

#### **Energy Efficiency Standards and Labeling Scheme**

Energy efficiency standards and labeling is about protecting consumer right to making an informed purchase decision. It is also about protecting consumers from buying appliances and equipment that use excessive electricity relative to other brands and models. It is about helping consumers cope up with the high cost of electricity by empowering them to choose the appliance model that provides the same amount of performance at lower electricity consumption.

In 1993, the government required all window type air conditioners in the market to meet a certain level of energy efficiency in an effort to weed out inefficient units in the market. The government has also required this type of appliance to carry an energy label to help the energy conscious consumers choose the right size for their cooling needs as well as to choose the model that could provide lower electricity consumption.



Following the success of the aircon program, the energy labeling of the more popular sizes of refrigerators was put on stream toward the end of 1999. In the year 2001, the government expanded the program to cover as well the split type of room air conditioner. During the same period, consultations with the concerned private sector have been held to pave the way for the implementation of

energy standards and labeling for two lighting products namely, the fluorescent lamp ballast and the compact fluorescent lamps.

This initiative will directly benefit the masses, particularly the lower income group whose electricity bill is mainly due to lighting. Before the end of 2006, the consumers would be able to find ballast products in the market with labels indicating power consumption ratings. On



the other hand, the compact fluorescent lamps would have labels showing the light output rating, the wattage rating, the efficacy and average life rating.

In general, energy efficiency standards and labeling provides significant benefits not only to the consumers but to the country as well. By requiring the manufacturers to declare the performance and energy consumption of their product, the government is encouraging the production of better quality products which helps the economy. It makes our local products become more competitive in the open market. The program also has prevented the country from being a dumping ground for imported inefficient products.

From the energy point of view, the energy savings generated which give the guideline to use the more energy efficient products as well as less importation of fuel products. From the environment point of view, the program has significantly contributed to lower emissions and reduced pollution from the power generating plants as a result of lower electricity consumption.

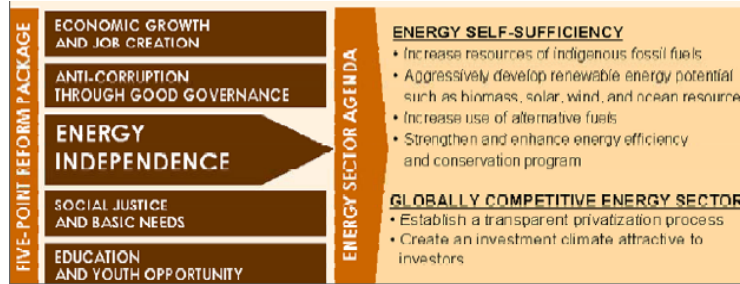
#### **4.2 *Philippine Department of Energy's main office***



The Philippine Department of Energy is situated at the fast developing Fort Bonifacio, Taguig City. Despite being a government department, the outdoor environment of DOE is graceful with a lot of green.

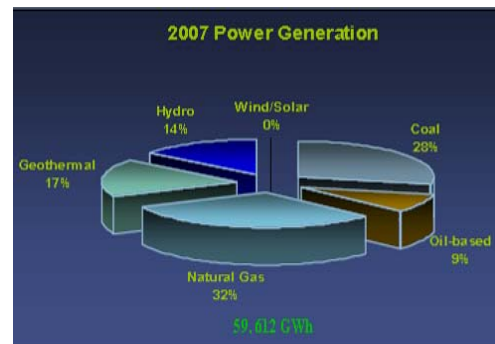
It is fortunate to have Mr. Angelo Reyes, Secretary of the Office to give us an overview of the electrical grid of the Philippines as well as their strategy in energy conservation.

The Philippine Department of Energy has a clear objective in building their power generation system and education to the people.



To better spread the knowledge of energy conservation, DOE makes knowledge fact-sheets for the public. They are distributed in the Philippines’ most popular fast food shop – Jollibee. According to the Mr. Reyes, the result was encouraging and they are doing it regularly to spread the message.

In the Philippines’ growing energy demand, natural gas fired is the dominant source of fuel for power generation after replacing coal in 2005. Its share in the mix is consistently increasing from 18.1% in 2002 to 31.52% in 2007. Geothermal contributes as another significant source of power.



The Philippine government is very keen on developing the usage of renewable energy. The geographical orientation of the Philippines provides a variety of natural sources of energy, which includes the following :

- Ocean Thermal
- Ocean Tidal
- Ocean Wave



Biofuel is another growing alternative source of power. The Philippines has an advantage, the wonderful climate for plant growth. Shown below are some examples of biofuels being used or expected to be used in the islands:

- Coconut Residues
- Rice Residues
- Bagasse

The progress of using biofuel is not solely beneficial to the Filipinos, but people around the globe.

## 5. Factory Visit

### ***Concepcion-Carrier Air Conditioning Company (CCAC)***

Formed in January 1998, Concepcion-Carrier Air Conditioning Company (CCAC) brought together two leaders in the air conditioning industry: Carrier Corporation of the United States as well as Concepcion Industries, Inc. of the Philippines. In just a few years, CCAC expanded from manufacturing window room air conditioners (WRAC) to become the market leader in virtually all categories of HVAC equipments and services in the country.

Carrier products are designed in engineering centers and manufacturing facilities located worldwide. Spread across six continents, Carrier's global operations make it the largest manufacturer of air conditioning, heating, ventilation and refrigeration products. It is supported by a vast network of distributors, dealers, retailers, and technicians who sell and install their products in over 170 countries. The plant also can achieve to 95% efficiency and the production volume is the highest during the time from March to May.



CCAC also emphasizes the importance of employees. While the company puts a large amount of resource in occupying the market share and maintains the customer satisfaction, the company sets up a People Committee to balance the employee right and satisfaction in the company, which greatly helps to share their achievement with their employees. With the co-operation of employer and employees, the Company is able to take 35% market share and

maintain 64% brand loyalty of customer, which is a high rating compared with the competitors in the Philippines. There is also a 24-hours service call centre to deal with product and service enquiry.

After the description of the background of the Carriers, we had a chance to visit the Air-conditioning manufacturing plant. Actually, although the production process was described in books, it was rare to access to the real working place and looked through the whole the manufacture process.

Inside the plant, there were many sections and each section had its own working process. For example, copper tube bending, case shape forming, assembling, welding and testing. After we looked through the process, we had a better understanding about the real process

had a better understanding about the real process and gained the benefits on it. The workers were very careful to handle the welding process to ensure no any leakages and uneven distribution on the joining part as it would create the turbulence in the fluid flow. It was also showed that the waste water from the manufacturing process could be treated and pumped out to the pond to feed the fish.

Moreover, there is a control panel room to monitor the system. The room contained some testing devices to monitor the air temperature different between indoor and outdoor in the plant. In the Philippines, the standard outdoor air temperature is 36°C and the standard indoor temperature air was 27 °C. It is a bit different from Hong Kong. There was also a sealed room to test the noise production of the sample air-conditioners. Actually, in that room, ears might felt painful due to the pressure difference and so it was uncomfortable to stay in this environment for a long while.



## 6. 9th International Food & Beverage Exposition 2008

With the fast population growth and rapidly increasing levels of industrial output, the demand for more efficient F&B manufacturing equipment and technologies rises. The International Food and Beverage Exposition is the only exhibition for the food and beverage manufacturing and technologies industry in the Philippines. Also, it integrates food ideas, food professionals, food producers, retailers, wholesalers, manufacturers and food technology experts from all around the world.



The exposition consists of two major sections, namely F&B equipment as well as Food Fest Bazaar. To begin with, the exposition aims to provide an opportunity for F&B manufacturing equipment and technologies suppliers to present their products and services. The focuses include diverse technologies, equipment and machineries that cover the entire F&B manufacturing (production / brewing/ baking), packaging (bottling / retail re-packing), storage and distribution (refrigeration / logistics / display appliances) industries and its related services. On the other hand, the Food Fest Bazaar features quality, export-ready food products from fresh and processed fruits to meat and seafood products.

Over 100 exhibitors participated in the event and some of the special exhibitors are highlighted as below.

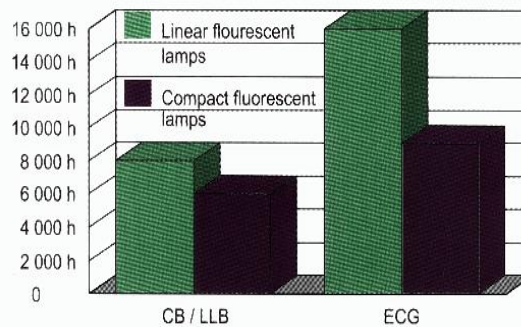
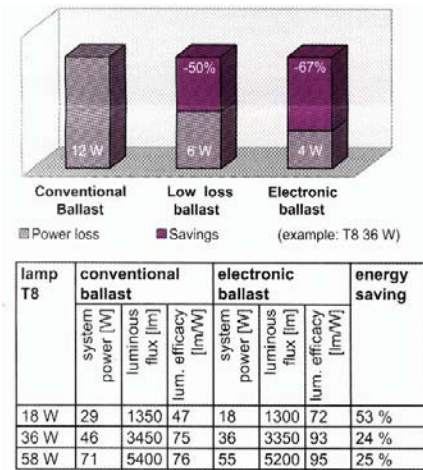
### **6.1 Product example : BAB Electronics – Multi-lamp light technology dimmable design**

Electronic Control Gear Unit (EGC) maximizes the lamp life time due to program warm start

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technology. It has a constant light regulation and direct current operation. It can be started reliably even at low temperatures. This system has a safety switch-off in case of abnormal lamp operation and end-of-life recognition. The lamp will restart automatically after lamp replacement. It is energy efficient as it reduced power consumption.



## 6.2 Product example : Iwata - Swamp cooler

Studies have repeatedly shown that heating and cooling systems account for over half of a household's energy bill. However, finding an energy efficient way to stay cool may seem like a daunting task. Luckily, if you live in a hot and arid climate, you can find respite from the summer heat with the use of a swamp cooler. Providing significant temperature reductions of several degrees in optimal conditions, swamp coolers have also been found to use up to one-fourth less energy than the traditional air conditioners.

Water removes heat from the condenser coils far more efficiently than air. The heat transfer and evaporative process can be increased via a fan on top of the condenser.



## 7. ASHRAE Chapter Regional Conference (CRC)

11<sup>th</sup> Chapters Regional Conference (CRC) & Exhibit was held in 26 August 2008. This year, the theme was Sustainability in Food Technology through Refrigeration. Two guest AHSARE lecturers were invited to give lectures in technical sessions.

The first speaker was Ronald Vallort. His topic was Project Management and Food Processing Plant Design. Ozone depletion, global warming and energy efficiency are marked in the community. Engineering work derives these problems and engineers encounter the concerns of cost, government regulation, availability and global warming to reduce energy use. While the energy consumption and environmental impacts are concerned, the



importance of food safety and security is also demanding in the global community. Food safety aims to qualify our food in a non-pathogenic and tampering nature, as well as in suitable temperature, taste and texture. The security concern arise the consideration of temper proof equipment, documentation, infiltration of air and water and hazardous material. Hence, engineers have to design for the future, by standing the view of process, layout, employee consideration and building construction features to maintain qualified food provision in the community by air conditioning and refrigeration and other food processing plant features.

In a food processing plant, office space usually includes reception area, general office, plant manager office, conference room, breaker room, locker rooms, rest rooms, trucker's lounge and future construction. There are some special requirements in the plant. For example, site consideration should include the design for good traffic flow, drainage, truck apron-140' minimum, trailer parking, auto parking security and expansion. Common employee areas should also be designed in bright colour, outside light, high ceilings and open locker rooms. Fork lift maintenance and battery charging room should be located at convenient location off the Dock. 3 ton overhead crane, engineer's office and ventilation, and machine room should be designed for good maintenance access, epoxy coating on floor, electrical switch gears and MCC panel and good ventilation. The truck and rail docks should be kept in a suitable temperature, width, ceiling height, number of doors local trucks, trash compactor, stretch wrap, tilt table, overhead pallet storage and security.

Fire safety is also very important to protect employees and the plant. The selections of overhead sprinklers, in-rack sprinklers or heat detection system have to be well considered in fire protection of building from damage and injury, so as to maintain a safe working environment.

Maintenance cannot be ignored in daily work inside the plant since it can help to reduce production loss and depreciation by the provision of limit use of strip curtains, single slide manual doors, concrete truck paving, hydraulic “clean pit” dock levelers, structural steel storage racks and single ply EPDM roofs.



This lecture brought a very general and applicable principle in engineering work – “Good designs yield satisfactory results”, which is not only applicable in food processing plant, but also other buildings and infrastructure with special features.

Afterwards, Vincent Tse, the second guest speakers, was invited to share some of project case studies which were related to some distinctive building designs in Hong Kong. The first example is the Hong Kong Convention and Exhibition Centre (HKCEC). Energy saving has become the concerning part in the world. The effective energy saving methods should be applied in order to eliminate the waste of energy. In the case study of HKCEC, it contains the automatic switches which can be used to control the operation of the window in the building by avoiding the excessive sunlight from entering into the working areas and thus reduce the cooling loads inside the buildings.

Moreover, HKCEC uses the Preliminary Air Unit (PAU) and cooling coil for ventilation. In the non-operation hour, it is ventilated by the fans and PAU only. This arrangement can reduce the thermal loads in the centre and maintain the energy consumption for cooling at a lower level during the operation. Later, it was found that energy consumption can reduce 30% after those methods are applied. It shows that it is worth to apply such an energy strategy in other buildings.

Also, statistically, there are around 50% of air conditioned buildings in Hong Kong, mainly some commercial buildings and hotel complex which are cooled by sea water. The sea water cooling pipe has the material copper nickel 910 insides, which is good in resisting corrosion. Most of the commercial buildings normally close the window due to the polluted

environment in the surroundings. Meanwhile, ventilation is required among those buildings and the energy saving methods should be provided.

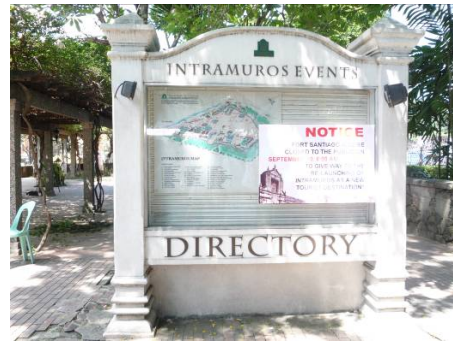
The second example shared by Vincent was the design of the ventilation system of a church building in Wan Chai, Hong Kong. The design of ventilation system made him impressive due to the reason of good system design of the church. At the very beginning, the space temperature is over 25 degree in the church and it is very uncomfortable. After checking all the things including the fan and air filter, it was found by him that there was a problem related to the depth of the church. Electric profile in the space shown that heat released was 2 times larger than the cooling from the air-conditioners. Remedial action was done after the problem was addressed. In the design, the church cannot put other duct or other plant due to the space limitation. Finally, the original duct was tee off and 50 tons PAU was added at the back to pre-cool the fresh air. The church was found to have satisfactory indoor temperature at last and this experience from this church building finally became his working guideline in the future work.



## 8. Sightseeing

### 8.1 *Fort Santiago*

Fort Santiago is a defense fortress built by Spanish conquistador, Miguel López de Legazpi. The fort is part of the structures of the walled city of Intramuros, in Manila, Philippines.



The location of Fort Santiago was also once the site of the palace and kingdom of Rajah Suliman, chieftain of Manila of pre-Spanish era. It was destroyed by the conquistadors upon arriving in 1570, encountering several bloody battles with the Muslims and native Tagalogs. The Spaniards destroyed the native settlements and erected Fuerza de Santiago in 1571.



The first fort was made out of log structures and earth. Most of it was destroyed in the Spanish-Chinese War of (1574-1575), by invaders of ethnic Chinese pirates who besieged the area. The Spaniards fought a bloody conflict and eventually drove the pirates out. In 1589 the fort was constructed with hard stone and finished in 1592. It became the main fort for travels and spice trade to the Americas and Europe for 333 years. The famous Manila Galleon trade to Acapulco, Mexico started sailing from Fuerza de Santiago.

The fort is shielded by 6.7m-high walls, with a thickness of 2.4m and an entrance measuring 12m high. It is located at the mouth of the Pasig River and it was once the premier defense fortress of the Spanish Government in the Philippines. During World War II it was captured by the Japanese, and sustained heavy damage from American & Filipino bombs during the

Battle of Manila in February 1945. It was later restored by the Intramuros Administration during the 1980s. Today the fort serves as a museum which houses well-preserved legacies of the Spanish government and the prison dungeons for criminals used by the Spanish officials.



## **8.2 Manila American Cemetery and Memorial**

The Manila American Cemetery and Memorial in the Philippines occupies 152 acres on a prominent plateau, visible at a distance from the east, south and west. It contains the largest number of graves of our military dead of World War II, a total of 17,202, most of whom lost their lives in operations in New Guinea and the Philippines. The headstones are aligned in 11 plots forming a generally circular pattern, set among masses of a wide variety of tropical trees and shrubbery.

The chapel, a white masonry building enriched with sculpture and mosaic, stands near the center of the cemetery. In front of it on a wide terrace are two large hemicycles. Twenty-five mosaic maps recall the achievements of the American armed forces in the Pacific, China, India and Burma. On rectangular Trani limestone piers within the hemicycles are inscribed the Tablets of the Missing containing 36,285 names. Rosettes mark the names of those since recovered and identified. Carved in the floors are the seals of the American states and its territories. From the memorial and other points within the cemetery there are impressive views over the lowlands to Laguna de Bay and towards the distant mountains.



## 9. Words from Delegates

“It’s my honor to join this study tour in The Philippines. I can meet people from other countries and communicate with them. After I visited the two universities in the Philippines, I learnt more Philippine culture from their students. Besides, I was cheerful to visit some places in Manila such as SM Mall of Asia, Manila Bay and Manila American Cemetery. Manila is a funny and charming place. The atmosphere in the Philippines was filled with melody and Filipinos were nice. I felt enjoyable in the Philippines. This trip not only broadened my view, but also I recognized students from other countries.”



Lei Siu Man, Florence (CityU)

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“This was indeed a memorable journey in my life. This trip gave me a good opportunity to learn a lot and it was the most precious experience. In the trip, I learnt a lot of technical knowledge and knew more about energy efficiency by visiting the Department of Energy and testing laboratory the Philippines. Besides, it provided a special experience for us to have a plant tour in Carrie Air-conditioning Corp.

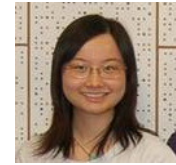
On the other hand, I met many new friends from other countries, so I could know more about the cultures of different countries. During the Student Forum and the Manila City Tour with the other chapter’s students, I had good communication with them. Finally, I am glad that I have met many new friends in this unforgettable and valuable tour.”



Li Shuk Wan, Iris (CityU)

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“The 7-day study tour gave me an unforgettable memory. The schedule was planned well and we had at least two visits every day. Lots of things have been learned in the Philippines. Moreover, we got the chances to make friends with Philippine students. From them, I learned the traditional culture there. What a wonderful trip it is!”



Poon Hao Chi, Cynthia (CityU)

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“Firstly, I would like to thank ASHRAE Hong Kong Chapter for providing a valuable chance for me to explore myself in the Philippines. The zeal of the universities’ staff and students there made me cheerful. I also met other students from different Southeast Asian countries. The academic and cultural exchange really widened my horizons.

I really appreciated that the predecessors in our industry are willing to share their experience with us. We could know the tendency of our industry by attending the technical seminars in the CRC and universities. Finally, I would like to thank Dr. Sam Hui and all the other accompanies in this study tour.”



Kam Hung Pong, Lewis (PolyU)

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“I am delighted that I can join this Philippines study tour. It is a valuable chance that I can meet people from other countries and play with them. In the university visit, I learnt some funny Pilipino. We also had the chance to visit the Concepcion-Carries Air conditioning Corporation and the International Food and Beverage Exposition 2008, which was the most interesting. This trip did not not only broadened my view in the Philippine culture, but also I knew many other university students. Finally, I would like to thank ASHRAE Hong Kong Chapter, Dr. Sam Hui and our team leader to organize this trip for us.”



Yau Tik Choi, Dicky (HKU)

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“Exploring different cultures and customs was an interesting experience and I really enjoyed communicating with different people around the world. The Philippines Study Tour was an unforgettable experience for me. In the seven-day trip, I made friends with students from different ASHRAE chapters. We participated in various kinds of activities, including visiting universities, factories, exhibitions, attending conference, preparing culture performance, sightseeing, etc, which made me feel excited and fulfilled.

I would like to thank the Philippines Chapter and I was deeply impressed by the passion and enthusiasm of the host. People in the Philippines were so nice and I enjoyed those days with the blue clear sky in Manila. Visiting thousands of white crosses in Manila American Cemetery and the giant statue in Rizal Park were also impressive. I am looking forward to visiting the sun and beach in Cebu next time.”



Wong Wai Ki, Xavi (HKU)

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“It is my first time to visit the Philippines. I like the blue big sky there, which made me unforgettable.

For the technical sessions, the visits to the Concepcion-Carrier Air-conditioning Corporation plant, Philippine Department of Energy and Testing Laboratory and Main Office and 9th International Food and Beverage Exposition 2008 gave us good chances to broaden our view by seeing more worldwide technology and engineering. These experiences also remind me that it is not enough for us to stay in Hong Kong to work for engineering only.

Academic and cultural exchanges with students from other countries in various activities were also excellent session in this study tour and I had made many friends there.”



Yu Man Piu, Bill (HKU)

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“There was no mosquito and housefly. There was no beggar. The street was clean though there was no rubbish bin. The sky was very clear that I have not seen it before. Where is it? It is the Philippines!

Happiness passed extremely fast. The schedule was very tight in this seven-day trip. The feeling was just like an air conditioner system without air duct. It was discontinuous. But I realized that people’s desire was infinity. Other than taking photos with ASHRAE president, it was delighted that we had a chance to visit some places in Manila such as Mall of Asia, Mass Rapid Transit (MRT) and Manila American Cemetery.

The atmosphere in the Philippines was filled with freedom. It made me feel enjoyable. When I was walking along the Manila Bay, I could touch the sky with my hand. No one knew me there and I could do anything I want. My heart was immersed into the Manila Bay. If I have a chance, I will be back! I would like to take the chance to say “salama” to the all friends. “Mahal Philippines!” and “Ma mimiss kita”.”



Poon Kowk Cheung, Raymond (HKU)

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## Appendix - Photo Gallery



Say Bye to Hong Kong..

Our leader Dr Sam Hui



HK Chapter

Happy time with Filipino boys



Happy time with Filipino girls

Good Show in Banquet Dinner !!





Delicious Filipino food~

Handsome boys?



Jeepney – Public utility vehicle in the Philippines

Let's fly !



Manila Hotel is so big !~

Fly back to HK





*That's the end ! ~*



**Jointly organized by**  
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