

A Partner of **DIFFERENCE** 不一樣的伙伴



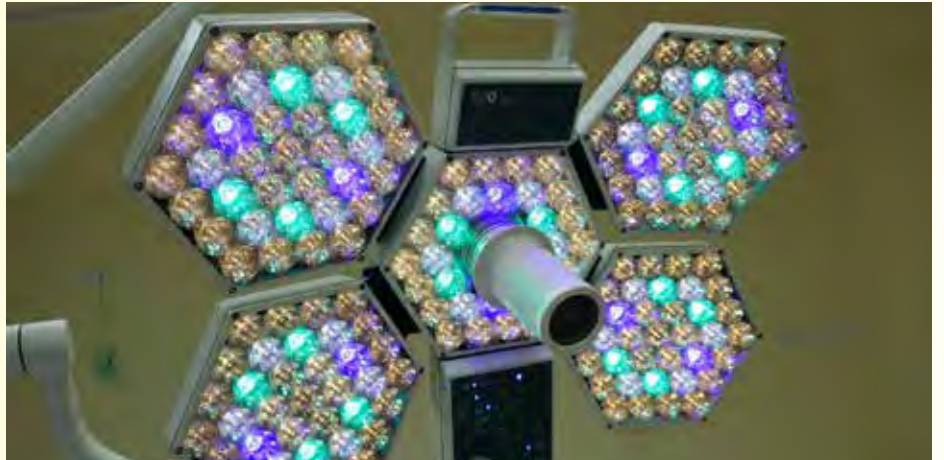
非一般的機電服務伙伴 提供全面的工程服務

A Partner Offering No Ordinary E&M Services

作為客戶的長期伙伴，機電工程署（機電署）早在客戶的新場地及新機電系統的設計初期，以至該等系統的測試和驗收階段，均會為客戶提供機電顧問和技術支援等增值服務，以確保各項系統日後的運作及保養更能配合客戶不同場地的運作需要，為市民帶來更大裨益。我們為客戶提供的全面服務並非只局限於維修保養範疇，還包括資產管理、機電系統的優化及更新等，令我們成為非一般的工程服務供應機構。

醫院管理局（醫管局）近年有多個醫療設施相繼落成或改建，包括天水圍醫院、新的油麻地專科門診診所、改建的瑪麗醫院T座，我們為這些設施提供了不少前期增值服務。

在水圍醫院的設計初期，我們與醫管局和其他持份者緊密合作，並就醫院內特有的服務，從機電系統操作及保養的角度給予專業意見。舉例來說，我們建議為氣動管道輸送系統增設感應器，以偵測是否有文件或血液樣本停留在管道內以便及時收回，減低對醫院運作的影響。此外，我們與時並進，就新科技的開發及應用，調派機電專才為客戶測試和驗收最新的醫療設備和高節能機電設施，例如發光二極管手術室照明系統、熱回收冷水機組、無油磁浮式製冷機組等。我們一直為客戶引入和



嶄新的發光二極管手術室照明系統配備色溫調節功能，較傳統照明系統有更長的壽命和較低的能耗。
Compared with conventional operating theatre (OT) lighting, new LED type OT lighting has the new feature of colour temperature adjustment, as well as longer life-span and lower power consumption.

應用新科技，以提升設施運作效率，並在顧及設施生命周期的同時，達至節約能源的目的。

為提升機電設施的維修保養效率，我們計劃為客戶引入嶄新的「建築信息模擬－資產管理」系統，而天水圍醫院將成為這個先導項目的首個醫療場地。

As a long-term partner of our clients, the Electrical and Mechanical Services Department (EMSD) provides them with value-added services, such as electrical

and mechanical (E&M) consultancy and technical support services at the early design stage of their new venues and new E&M systems, as well as the testing and commissioning stages of these systems. Our aim is to ensure that the future operation and maintenance of these systems can meet the operational needs of different venues of our clients so as to better benefit the public. The comprehensive services for our clients are not limited to maintenance, but also include asset management, E&M system enhancement and optimisation, hence



天水圍醫院有不少高科技的環保設施，例如太陽能熱水系統。
Tin Shui Wai Hospital has many high-tech green facilities, e.g. solar water heating system.

making us a provider of no ordinary engineering services.

In recent years, several new healthcare venues of the Hospital Authority (HA) have been constructed or renovated, which include Tin Shui Wai Hospital, the new Yau Ma Tei Specialist Clinic and the renovated Block T of Queen Mary Hospital. We have provided various value-added services at the early stage of these projects.

During the initial design stage of Tin Shui Wai Hospital, we worked closely with HA and other stakeholders, and offered professional advice on services unique to the hospital from the perspectives of operation and maintenance of the E&M systems. For example, we proposed to add sensors to the pneumatic tube transport system to detect any trapped documents or blood samples so that they could be retrieved in time, thus minimising interruption to hospital services. Besides, in keeping abreast of contemporary technologies and their applications, E&M experts were deployed to the testing and commissioning of the latest medical equipment and high energy-efficient E&M facilities, such as LED lighting system for operating theatres, heat



早於天水圍醫院的設計初期，我們便從機電系統操作及保養的角度給予專業意見。

As early as the initial design stage of Tin Shui Wai Hospital, we have been offering professional advice on services unique to the hospital from the perspectives of operation and maintenance of the E&M systems.

recovery chillers and oil-free chillers. All the way, we have been introducing and applying new technologies for our clients to enhance the operational efficiency of the facilities, and to achieve the objective of saving energy taking account of their life cycles.

As our continuous effort to improve the maintenance efficiency of the E&M

facilities, we plan to introduce our innovative Building Information Modelling - Asset Management System to our clients. Tin Shui Wai Hospital will be the first healthcare facility under this pilot project.



項目管理靈活應變 獲申訴專員嘉許

Ombudsman's Award for High Flexibility and Responsiveness in Project Management

機電署專業團隊時刻想客戶和市民所想，急他們所急，並以積極和專業的態度協助他們解決各項問題，為九龍城街市更換自動梯便是其中一個例子。雖然面對種種限制，但團隊仍然努力不懈，尋求適切的解決方案，並靈活協調各方的訴求和需要，令更換工程最終順利完成，更獲得申訴專員的嘉許。

就九龍城街市老化的自動梯，我們與食物環境衛生署(食環署)商討有關的更換工程事宜。當我們與食環署、街市商戶商議更換工程的動工日期時，接獲對施工期時間和圍板安排的投訴。經了解有關問題及受工程影響商戶的憂慮後，我們提出解決方案，調動工程工序，務求把更換工程對商戶和市民造成的影響減至最低。新方案可縮短商戶的停業時間，獲食環署和商戶一致贊成。然而，在工程開展後不久，承辦商位於屯門的倉庫因受旁邊倉庫起火波及，導致所存放的新自動梯被焚毀。我們於是立即作出跟進，要求製造商加快製造一台新的自動梯及盡早運送到港，並臨時拆除圍板和填封舊自動梯的地台，以重新開放有關空間從而減低對街市運作造成的影響。我們亦加緊督促承辦商進行自動梯抵港前的預備工作，並在自動梯運抵本港後安排人手在晚間工作以加快完成更換工



更換工程後的九龍城街市自動梯。
The escalator at Kowloon City Market after the replacement.



程，好讓市民及商戶能盡早享用新的自動梯。

為達至有效溝通，我們經常與商戶會面和商討，並輔以圖像解釋施工程序。這個工程項目的最大挑戰，是如何在保持項目質素的情況下，以靈活變通的方法滿足商戶的訴求，並尋找能令持份者和市民滿意的

方案，最終達到「三贏」的局面。

在整個過程中，我們與區議員、立法會議員代表、食環署和商戶保持恆常溝通。在團隊的努力下，我們以靈活多變的項目管理手法為客戶和市民解決各種難題，贏得持份者的讚賞。此外，該工程項目的工程師更獲頒「申訴專員嘉許獎」，以示表揚。

機場助航燈系統模擬器獲設計專利 服務質素再提升

Service Quality Further Enhanced with Patented Design of Airfield Ground Lighting Power Transfer Simulator

機電署不斷研發新系統，以提升服務質素。繼機場助航燈固定電流調節器測試平台獲得設計專利後，我們與香港機場管理局(機管局)再接再厲，合作設計及建造機場助航燈系統不斷電切換模擬器。由於該模擬器設計新穎、意念創新和實用性高，我們因此再次取得設計專利，這不但肯定了團隊的努力，更彰顯出我們為客戶持續創新、精益求精的服務精神。

為確保機場助航燈的供電系統保持穩定，我們在不阻礙日常航班升降的情況下，積極為客戶開發更佳方案，以少於一年的時間完成模擬器的設計及建造工作。該模擬

器不但可提升機場助航燈的操作和維修保養效率，而且成為了我們重要的技術訓練平台。該模擬器具有多項優點。第一，由於該模擬器是複製現有供電系統的模型，因此可用來測試元件；而元件通過測試後，可立即安裝於正式的供電系統上，從而縮短現場維修的時間，減少對跑道運作造成的影響。第二，該模擬器可模擬故障發生，協助負責維修的同事找出故障的潛在原因和制訂相應的糾正措施，以減少緊急維修的時間，提高維修效率。最後，該模擬器可用作教學平台，藉以培訓機管局和機電署的員工。

如客戶有意與我們合作研究申請專利，歡迎聯絡我們的高級工程師周旭麒先生(電話：2808 3804)。

EMSD is dedicated to developing new systems to enhance our service quality. After receiving the patent on the design of the Airfield Ground Lighting (AGL) constant current regulator testing platform, we worked again with the Airport Authority Hong Kong (AA) to design and build the AGL uninterruptible power transfer simulator (PTS). With the novel design, innovative concept and high degree of practicality of the PTS, our design was



我們發揮專業精神，令市民及客戶滿意自動梯更換工程的安排。該工程項目的工程師更獲頒「申訴專員嘉許獎」，以示表揚。

Thanks to our professionalism, our client and the public were satisfied with the arrangements of the escalator replacement works, and the engineer responsible for the project was presented with the Ombudsman's Award as recognition of our performance.

Our professional team always shares the concerns of our clients and the public and addresses their pressing needs, as well as helping them solve their problems with proactiveness and professionalism. The replacement of escalators at Kowloon City Market is one of the examples. Despite numerous constraints, we relentlessly searched for suitable solutions and addressed the needs and requests of different parties with flexibility. The project was finally completed successfully and earned us an Ombudsman's Award.

We worked with the Food and Environmental Hygiene Department (FEHD) on the replacement works for the aged escalators at Kowloon City Market. In the course of our discussion with FEHD and the tenants about the project

commencement date, we received complaints concerning the project duration and the hoarding arrangement. Having looked into the issue and understood the concerns of the affected tenants, we proposed a solution by rearranging the work processes in order to minimise the impact on the tenants and the public. The new plan could shorten the business cessation period and was well accepted by both FEHD and the tenants. However, shortly after the commencement of the project, a fire broke out in the neighbouring warehouse of our contractor's warehouse in Tuen Mun and destroyed the new escalator being stored there. We immediately took follow-up action by requesting the manufacturer of the escalator to expedite the production of a new

escalator for delivery to Hong Kong as early as possible. Meanwhile, the hoarding was temporarily removed and the platform of the previous escalator was backfilled in order to reopen the area as a way to minimise the impact on market operation. We also urged the contractor to complete all the preparatory work before the new escalator was delivered. Upon its arrival, additional night shifts were scheduled to speed up the replacement works for early use by the tenants and the public.

To achieve effective communication, we frequently met and discussed with the tenants and explained to them the working procedures with the aid of charts and diagrams. The biggest challenge of this project was to maintain work quality while flexibly addressing tenants' requests and finding out solutions that could satisfy all the stakeholders and the public in order to ultimately achieve a "win-win-win" situation.

Throughout the entire process, we maintained constant communication with the District Councillors, the representatives of Legislative Councillors, FEHD and the tenants. With the team's dedicated effort and flexibility in project management, we succeeded in solving the problems faced by our client and the public and earning commendations from all the stakeholders. The project engineer was presented with the Ombudsman's Award as recognition of our performance.

patented once again. This not only affirms our team's efforts, but also showcases our service culture which embraces continuous innovation and enhancement for our clients.

To ensure a stable power supply system for the AGL, we have actively looked for better solutions for our clients without interrupting the regular aircraft traffic, and eventually completed the design and building of the PTS in less than a year. The PTS not only enhances our efficiency in terms of operation and maintenance of the AGL, but also serves as an important platform for technical training. It has a number of advantages. Firstly, since the PTS is a model replicating the existing power supply system, it can be used to test parts and components. Once the parts and components pass the test, they can be installed immediately in the working power supply system. This helps reduce on-site maintenance time and the impact on the runway operation. Secondly, the PTS can simulate various faulty conditions, assisting our colleagues responsible for maintenance to identify the possible causes of failures and work out remedial measures



模擬器可作教學用途，透過模擬不同情景，讓員工更了解供電系統的運作。

The PTS can be used for training purposes. By simulating different scenarios, it gives the staff a better understanding of the operation of the power supply system.

accordingly so as to reduce the time for emergency repairs and enhance maintenance efficiency. Finally, the PTS can be used as a teaching platform to train the staff of the AA and EMSD.

If clients are interested to apply design patent with us, please feel free to contact Mr. Yorkie Chow, Senior Engineer, at 2808 3804.

配合「綠建環評」 加強總部大樓綠化

Promote Green Transformation of EMSD Headquarters Building for BEAM Plus

機電署一直重視環保和社區發展，不但向市民、客戶推廣節能減排，還致力綠化總部大樓，以及提供社區友善設施。總部大樓先後榮獲「綠建環評既有建築」最終鉑金級證書和「綠建環評社區」（先導評估）鉑金級證書，現已成為可持續發展的典範，同時也是九龍東一個可推廣低碳建築的綠色景點。

根據「綠建環評社區」的評估，總部大樓綠化改造工程包括多個重要項目，其中啓德發展區區域供冷系統分站的興建工程已於今年5月完成，並在6月正式啓用。連接啓德發展區區域供冷系統後，總部大樓每年可節省約170萬度電（相等於三百個家庭的平均用電量），約佔大樓總用電量的15%。大樓原有的冷凍機組和相關設施拆卸後，相關的維修費用便可節省，而原有空間更可騰出作其他用途。

此外，我們於今年2月也採用先進技術，在總部露天廣場裝設太陽能風能混合路燈，利用可再生能源推動可持續發展。太陽能風能混合路燈結合太陽能和風力技術，並使用發光二極管燈，比原有的路燈節省達90%電力。

我們將繼續實施具能源效益和綠化環境的措施，把總部大樓改造為更環保和可持續發展的建築。我們希望透過與客戶分享「綠建環評」認證的成功經驗，把認證推廣至客戶場地，進一步改善場地的能源效益及環境管理。

有興趣的客戶如欲了解「綠建環評」認證工作的詳情，歡迎聯絡高級工程師楊航愉先生（電話：2808 3594）。

安裝於總部的太陽能風能混合路燈比原有的路燈節省達90%電力。
The solar wind hybrid street lights installed at our headquarters achieve an energy saving of 90% as compared with the previous conventional street lights.



區域供冷系統分站的熱交換器為機電署總部大樓提供冷水，有助大樓每年節省約 15% 用電量。
The heat exchanger of the substation of the DCS provides chilled water for the EMSD Headquarters Building and helps achieve a saving of around 15% in the total electricity consumption.

EMSD has been attaching great importance to environmental protection and community development. We not only promote energy saving and carbon emission reduction to the public and our clients, but have also devoted much efforts to the green transformation of our headquarters building, and the provision of community-friendly facilities surrounding it. After being awarded the Final Platinum Rating Certification under BEAM Plus Existing Buildings and the Platinum Rating Certification under BEAM Plus Neighbourhood (Pilot Version), the headquarters building has become a role model of sustainable development, and a green attraction in Kowloon East promoting low-carbon buildings.

According to the assessment of BEAM Plus Neighbourhood, the green transformation of the headquarters building covers a number of major projects, including the construction of a substation of the District Cooling System (DCS) at the Kai Tak Development (KTD) which was completed in May and has commenced operation since June this year. Upon connection to the DCS at the KTD, there will be a saving of around 1.7 million kWh of electricity per year (equivalent to the average electricity consumption of 300 households), representing around 15% of the total electricity consumption of the

headquarters building. In addition, demolition of the original chillers and the related facilities will contribute to a reduction in the maintenance costs and vacate the space occupied by these facilities for other purposes.

By employing advanced technology, we also installed solar wind hybrid street lights at our headquarters piazza in February this year so as to promote sustainable development through renewable energy. With the combination of solar and wind power, and the use of LED lightings, the solar wind hybrid street lights achieved an energy saving of 90% as compared with the previous street lights.

We will continue to adopt more energy efficient and greening measures to transform the headquarters building into a more environmentally friendly and sustainable one. Through sharing our successful experience in obtaining BEAM Plus certification with our clients, we hope that with further enhancement of energy efficiency and environmental management, their premises will also be granted certification.

If clients are interested to know more about BEAM Plus certification, please contact Mr. Yeung Hong-yu, Senior Engineer, at 2808 3594.

利用虛擬實境推廣

「建築信息模擬－資產管理」系統

Using Virtual Reality to Promote Building Information Modelling – Asset Management System

我們研發的「建築信息模擬－資產管理」系統及相關研究成果，於今年初取得香港專利。其後，我們舉辦研討會和參與科技博覽會，向業界和公眾推廣這項嶄新的維修保養技術，以推動和鼓勵建造業和機電業採用該系統。我們利用虛擬實境技術，提供感官互動體驗，讓參加者可仿如置身實境般，了解該系統的應用。

為協助業界和公眾更容易明白該系統的運作，我們以天水圍醫院作為示範例子，利用頭戴式虛擬實境裝置及電腦屏幕，向參加者展示如何在醫院大樓的不同實境應用「建築信息模擬－資產管理」技術，以提升機電設備的維修保養效率。

今年3月和4月，我們與屋宇設備運行及維修行政人員學會合辦了兩場研討會，業界踴躍參與，多達280人出席。此外，我們在6月先後參與「香港工程師學會創意嘉年華2017」和「樂齡科技博覽暨高峰會」，展示「建築信息模擬－資產管理」系統的技術。業界和市民對此反應熱烈，並讚賞我們利用虛擬實境模式進行講解，令他們對該系統在維修保養工作上的應用留下深刻印象。

目前，政府資訊科技總監辦公室位於長沙灣的政府數據中心大樓、渠務署的馬鞍山污水泵房及建造業議會的零碳天地均計劃採用「建築信息模擬－資產管理」系統。

客戶如欲進一步了解「建築信息模擬－資產管理」系統，或有興趣引入這套維修保養技術，歡迎聯絡高級工程師陳賀賢先生(電話：2808 3593)。

機電署攤位所展示的創新科技研究成果，深受市民歡迎。

The innovative work showcased at the EMSD booth is well received by the public.

Early this year, our newly developed Building Information Modelling – Asset Management (BIM-AM) System and its related research outcomes were granted a patent in Hong Kong. Since then, we have organised seminars and participated in technology expos to promote this new maintenance technology to the trade and the public, so as to encourage the construction and E&M industries to adopt the system. On these occasions, virtual reality (VR) technology, which provided participants with sensational interactive experiences, was employed to help them understand the application in a reality-like situation.

To help the trade and the public to have a better grasp of the operation of the system, we used Tin Shui Wai Hospital as an example for demonstration. Through VR headsets and computer panels, we showed the participants how the BIM-AM technology was applied in different real scenes in the hospital building to enhance maintenance efficiency of the E&M equipment therein.

In March and April this year, we co-organised two seminars on BIM-AM with the Building Services Operation and Maintenance Executives Society. The response from the trade was overwhelming, with as many as 280 members participated. Besides, we took part in the HKIE Fiesta 2017 and the Gerontech and Innovation Expo cum

Summit in June. Once again, the response from the trade and the public was enthusiastic. They commended us for the use of VR in demonstrating the technology of the BIM-AM System,



參加者戴上虛擬實境的裝置，親身體驗「建築信息模擬－資產管理」技術的應用。

Participants wearing VR devices experience in person the application of the BIM-AM technology.

giving them a deep impression of its application on maintenance work.

At present, the Government Data Centre Complex, located in Cheung Sha Wan, of the Office of the Government Chief Information Officer, the Ma On Shan Sewage Pumping Station of the Drainage Services Department, and the Zero Carbon Building of the Construction Industry Council are planning to adopt the BIM-AM System.

If clients wish to learn more about the BIM-AM System, or are interested in adopting this new maintenance technology, please feel free to contact Mr. Steve Chan, Senior Engineer, at 2808 3593.



推行電子整流風扇先導計劃 冀為客戶節省能源

Save Energy through Electronically Commutated Fan Pilot Programme

政府承諾在2020年之前把政府建築物的用電量減少5%。為此，機電署積極尋找能源管理機會，以便利用最新科技協助客戶達成省電目標。

在空調系統中使用電子整流風扇(EC風扇)是最新的節能技術。今年年初，我們率先在機電署總部大樓安裝EC風扇，並同時推出一項先導計劃，積極向客戶推廣這項技術，而香港警察學院便是首個安裝EC風扇的客戶場地。

EC風扇可以提升空調系統的能源效益。在傳統的空調系統中，風扇是由交流電電動機驅動，但EC風扇則是由高效能的直流電電動機驅動，而直流電電動機本身已較傳統的交流電電動機節能10%。此外，EC風扇採用直流電變速技術，無須利用變頻器便可根據控制目標(例如溫度)改變轉速，令風扇的控制更精準，因而更加節能。舉例來說，當房間的溫度達到預設的控制目標時，電動機會自動減慢，減少耗電。

在先導計劃試行期間，我們會收集多方面的數據，並在明年年中進行檢討，以研究廣泛應用的可行性。

我們樂於與客戶分享這項先進設備的最新資訊，有興趣的客戶請聯絡高級工程師楊秀權先生(電話：2808 3717)。

The Government commits to reducing the electricity consumption in government buildings by 5% by 2020. In this connection, EMSD is proactively identifying energy management opportunities. Our aim is to help our clients



香港警察學院是首個安裝EC風扇的客戶場地。
The Hong Kong Police College is the first client venue that installs EC fans.

achieve their energy saving targets with the use of innovative technologies.

The use of electronically commutated (EC) fan in air-conditioning system is the latest energy saving technology. Early this year, we took the lead in installing EC fans at EMSD Headquarters Building. We also launched a pilot programme to proactively promote such technology to our clients, with the Hong Kong Police College as the first client venue installing EC fans.

An EC fan can improve the energy efficiency of an air-conditioning system. In a conventional air-conditioning system, alternating current (AC) motor is used to drive the fan. But for EC fan, high-performance direct current (DC) motor is used instead. By itself, a DC motor is 10% more efficient than a conventional AC motor. In addition, an EC fan employs DC speed control technology that can vary the speed in accordance with the control target (such as temperature) without the use of a frequency converter. This allows more precise control but less energy is consumed. For example, when the room temperature reaches the preset control target, the motor will automatically

slow down to reduce electricity consumption.

During the pilot stage, we will collect data on different aspects and review in the middle of next year to study the feasibility of a general rollout.

We are happy to share the latest information about this innovative device with our clients. Interested parties are welcome to contact Mr. Sammy Yeung, Senior Engineer, at 2808 3717.



EC風扇的直流電電動機不但耗電量低，而且體積細小。
The DC motor in an EC fan consumes less power and is very compact in size.

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