持 續 創 新　優 質 雋 永

Creativity and Innovation for Quality Excellence

QIESC
優質改善經驗交流會
2019

Organizer

KS 金城 1963 KUM SHING

Co-organizers

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

昇捷 SYNERGIS

煤氣 Towngas

MTR

背景及歷史
History and Background

為了面對顧客日益轉變的需求，今天，有許多商業機構都著重保持及提高品質服務水平，並視之為成功的重要元素。除了發展及應用有效的品質管理系統之外，機構亦鼓勵他們的員工成立品質改善小組或品質圈，就日常運作定期提出改善建議，以達致顯著、實質及配合營運政策的成效，從而提升生產力及員工能力。本著和其他機構交流切磋、互惠互利的宗旨，一個舉辦優質品質改善個案分享會的念頭誕生了。

第一屆優質改善經驗交流會由六間機構於1997年攜手創辦，其後得到其他機構的支持及響應，交流會成為了一年一度的品質圈盛事，並由各機構輪流主辦。

In an ongoing effort to meet the changing needs of customers and maintain a competitive edge, many businesses are focusing today on sustaining and enhancing quality service - which is regarded as an important element of success. In addition to developing and applying effective quality control systems, they encourage their staff to set up Quality Improvement Teams (QITs) or Quality Control Circles (QCCs). These teams regularly put forward suggestions for improvements in daily operations, and have achieved substantial and tangible results concordant with operational policies that enhance both productivity and staff capabilities. With an aim to sharing and learning together to reach a win-win situation among businesses, the idea to organize experience sharing conventions for successful quality improvement cases was initiated.

The first Quality Improvement & Experience Sharing Convention was instituted in 1997 by 6 participating organizations. With strong support from other organizations thereafter, the Convention has become an annual major quality event with participating organizations taking turns to host.

標誌 The Logo

此標誌為優質改善經驗交流會而設計，於2001年起沿用至2018年。標誌上的人頭和引號代表各優質機構彼此的交流，拼構成的「Q」字則凸顯機構優質管理的成就。

標誌亦象徵交流會為各優質機構提供了交流優質管理經驗的平台，讓成員們共同分享優質管理的美好成果。

This logo was especially designed for the Quality Improvement and Experience Sharing Convention and was used between 2001 and 2018. The silhouetted heads and the inverted commas symbolize the sharing among the quality organizations, whereas the letter "Q" formed highlights the organizations' achievements of quality management.

This logo also represents QIESC's role as a platform for exchange and experience sharing, enabling QIESC's members to share the fruitful outcomes as a result of their quality management.

標誌 The Logo

QIESC
優質改善經驗交流會

優質改善經驗交流會於2019年開始採用新標誌。標誌由不同形狀、長短及 色的方塊及線條拼構而成，象徵優質改善經驗交流會的成員來自各行各業。

標誌拼構成「Q」字，除凸顯各優質機構取得的成就外，亦代表優質改善經驗交流會為各成員提供了交流優質管理經驗的平台，使機構能與時並進，分享優質管理的美好成果，共同邁向優質管理的目標。

Adopted since 2019, this new logo is composed of blocks and lines with different shapes, sizes and colors, representing the diverse backgrounds of QIESC's members.

The logo forms a letter "Q", highlighting not only the enterprises' achievements of quality management, but also QIESC's role as a platform for exchange and experience sharing. With QIESC, the quality organizations can keep each other updated on their quality management practices as well as to share the fruitful outcomes as a result of their quality management.

歷屆主辦機構 Host Organizers

1997 (1st)
九廣鐵路公司
Kowloon-Canton Railway Corporation

1998 (2nd)
香港中華煤氣有限公司
The Hong Kong & China Gas Co. Ltd.

1999 (3rd)
屯門醫院
Tuen Mun Hospital

2000 (4th)
新昌管理服務有限公司
Synergis Management Services Ltd.

2001 (5th)
香港郵政
Hongkong Post

2002 (6th)
富士施樂(香港)有限公司
Fuji Xerox (Hong Kong) Ltd.

2003 (7th)
香港賽馬會
The Hong Kong Jockey Club

2004 (8th)
港鐵公司
MTR Corporation

2005 (9th)
機電工程署
Electrical and Mechanical Services Department

2006 (10th)
維他奶國際集團有限公司Vitasoy International Holdings Ltd.

2007 (11th)
電訊盈科有限公司
PCCW Limited

2008 (12th)
香港中華煤氣有限公司
The Hong Kong & China Gas Co. Ltd.

2009 (13th)
新昌管理服務有限公司
Synergis Management Services Ltd.

2010 (14th)
富士施樂(香港)有限公司
Fuji Xerox (Hong Kong) Ltd.

2011 (15th)
香港賽馬會
The Hong Kong Jockey Club

2012 (16th)
港鐵公司
MTR Corporation

2013 (17th)
維他奶國際集團有限公司
Vitasoy International Holdings Ltd.

2014 (18th)
香港房屋協會
Hong Kong Housing Society

2015 (19th)
香港中華煤氣有限公司
The Hong Kong & China Gas Co. Ltd

2016 (20th)
中華電力有限公司
CLP Power Hong Kong Ltd.

2017/18 (21st)
昇捷控股有限公司
Synergis Holdings Ltd.

2019 (22nd)
金城營造集團
Kum Shing Group

背景及歷史
History and Background

節目程序
Programme Rundown

13:30	接待嘉賓 Cocktail Reception for VIP
14:15	入場 Admission
14:30	開幕儀式 Opening Ceremony
14:35	致送紀念品予協辦機構 Souvenir Presentation to Co-organizers
14:40	金城營造集團執行董事兼營運總裁 高志偉工程師致開幕辭 Opening Speech by Ir Gary Ko, Executive Director and Chief Operations Officer of Kum Shing Group
14:50	香港機場管理局 - 發佈提案 Presentation by Airport Authority Hong Kong
15:00	昇捷控股有限公司 - 發佈提案 Presentation by Synergis Holdings Limited
15:10	香港中華煤氣有限公司 - 發佈提案 Presentation by The Hong Kong and China Gas Company Limited
15:20	港鐵公司 - 發佈提案 Presentation by MTR Corporation
15:30	金城營造集團 - 發佈提案 Presentation by Kum Shing Group
15:40	投票時間 及 中場休息 Vote Casting and Break
16:10	致送紀念品予發佈隊伍 Souvenir Presentation to Presentation Teams
16:15	頒發獎項予得獎隊伍 Prize Presentation to Winning Teams
16:25	金城營造集團企業安全主管 劉家樂先生致閉幕辭 Closing Speech by Mr. George Lau, Head of Corporate HSE of Kum Shing Group
16:30	交接儀式 Handover Ceremony
16:35	節目完結 End of Programme

主辦機構獻辭

王紹恒先生

金城營造集團行政總裁

歡迎各位參與2019年度優質改善經驗交流會。

金城能夠首次主辦這項富有意義的盛事，實在深感榮幸。優質改善經驗交流會的設立，旨在協助不同界別的企業聚首一堂，彼此交流優質改善範疇的看法和意念。看見每年參與這項活動的會員機構數目均有所增加，令我們高興不已，足證各行各業的公司均日益注重優質改善的理念。

本年度的主題是「持續創新 優質雋永」，彰顯了廣納創新思維，如何與推動優質執行方式息息相關。優質卓越標準絕非誤打誤撞所能締造，而是日積月累，不斷追求的成果，當中必須將創新意念，融入日常工作的習慣，方能實現。

創意旅程，永無止境，唯有不斷努力，方能力臻至善。企業發展有如創建萬丈高樓，仰賴的基石就是創意。唯有發揮創意，精益求精，才能提升競爭力。邁向優質卓越之道，必須不斷修築，並無捷徑，而優質改善經驗交流會，正是不可或缺的平台，鞭策我們追求優質卓越。

金城是香港的能源和交通基建專家，走在推動優質改善的尖端，並且榮獲香港管理專業協會所頒發的「優質管理獎 - 金獎」，可說是企業管理專業的最高榮譽之一。金城能夠成為首家獲得金獎的工程和建築企業，令我們引以為傲。

我們經營業務，處處以追求優質卓越為先，並且將創意植根心中。只要符合營運所需，金城歡迎一切變革和創新，務求締造雙贏局面，驅動旗下業務不斷發展。貫徹創新，是我們建立今日成就的一大關鍵。面對瞬息萬變的經濟和科技趨勢，我們大力投資，為核心業務建立綜合科技和設計，協助將香港打造成更智能化和更具可持續發展實力的城市。

我們自豪，因為看見今天所有會員機構均齊心一意，致力追求優質管理，令人極感鼓舞。我們讚賞彼此如何發揮創意，為業務帶來優質改善。

我們興奮，因為只要有大家堅定支持和積極參與，本年度的交流會必定能再次啟迪思維，結下纍纍碩果！

Message from the Host

Mr. Rex Wong

Chief Executive Officer, Kum Shing Group

It is my great pleasure to welcome you to the 2019 Quality Improvement and Experience Sharing Convention (QIESC).

It is a tremendous privilege for Kumshing to host this meaningful event for the first time. The QIESC platform brings together enterprises from diverse fields to exchange views and ideas about quality improvement. We are very glad to see that the number of participating members continues to increase each year. Interest in quality improvement by companies in all sectors is mounting.

This year's theme "Creativity and Innovation for Quality Excellence" highlights the unbeatable connection between eagerness to bring in new thinking and the desire for quality execution. Excellence is never an accident. Rather it is the cumulative result of always striving to do better. Disseminating this realization of how innovative ideas blend into our working habits is at the heart of the QIESC mission.

The innovation journey never ends. It is the cornerstone of corporate development and the key for survival in the marketplace. Only with the ever-raising standards through creativity are companies able to increase their competitiveness. The road to quality perfection is always under construction, and this convention provides an impeccable platform for us to pursue quality and excellence.

As Hong Kong's energy and mobility infrastructure specialist, Kumshing is at the forefront of driving for quality improvement. The company is a proud winner of the Gold Award of the Hong Kong Management Association Quality Award, the first engineering and construction company to be so honored with one of the most prestigious accolades in local professional enterprise management.

Quality and excellence are always at the top of our agenda, as innovation is at our heart. Kumshing embraces any change and innovation that serves our operational needs, creating a win-win situation among businesses that helps drive continuous development. The ability to follow through and innovate has long contributed to our success story. Riding economic and technology trends, we have invested substantially to integrate technology and design with our core business as we work to develop Hong Kong into a smarter and more sustainable city.

We are proud and encouraged that all member companies share the same commitment to quality management today. On this special occasion, we come together to celebrate innovations that bring quality improvement to business.

I am sure with your steadfast support and active participation, this year's convention will undoubtedly unfold as another stimulating experience for all involved, with many fruitful outcomes!

大會顧問及評判

機構 ORGANIZATION	香港機場管理局 Airport Authority Hong Kong	昇捷控股有限公司 Synergis Holdings Limited	香港中華煤氣有限公司 The Hong Kong and China Gas Company Limited
大會顧問 ADVISORY PANEL	**黃家和 先生** 副總經理 – 工程及維修 **Mr. Kelvin Wong** Deputy General Manager, Technical Services	**鄭文智 先生** 高級經理 – 品管 **Mr. Frankie Cheng** Senior Manager – Quality Assurance	**陳華娟 女士** 助理總經理 - 業務分析及數碼發展部 **Ms. Queenie Chan** AGM - Business Analytics and e-Development
大會評判 PANEL OF JUDGES	**黃家和 先生** 副總經理 – 工程及維修 **Mr. Kelvin Wong** Deputy General Manager, Technical Services	**朱銳峯 先生** 分區經理 **Mr. Edvan Chu** Area Manager	**伍杏偉 先生** 總經理 – 輸氣操作 **Mr. Brian Ng** General Manager – Transmission Operation

Advisory Panel & Panel of Judges

港鐵公司 MTR Corporation	金城營造集團 Kum Shing Group	香港品質管理協會 Hong Kong Quality Management Association	機構 ORGANIZATION
梁秉堅 先生 臻善圈訓練、推廣及外務委員會主席 **Mr. Edrey Leung** WIT Council Training, Promotion and External Affairs Committee Chairman	**高志偉 先生** 執行董事兼營運總裁 **Ir Gary Ko** Executive Director & Chief Operating Officer	**林建新 博士** 主席 **Dr. Frankie Lam** Chairman	大會顧問 ADVISORY PANEL
曾永昌 先生 學習進修主管 **Mr. Chester Tsang** Head of Learning	**劉耀輝 博士** 高級總監 - 供電系統及人力供應 **Dr. Steven Lau** Senior Director - Power System & Manpower Supply	**梁偉强 博士** 董事 **Dr. Victor Leung** Director of Training	大會評判 PANEL OF JUDGES

優質個案

香港 國際機場 HONG KONG INTERNATIONAL AIRPORT

香港機場管理局
Airport Authority Hong Kong

縮短行李分揀系統預防性維修的時間，並提升系統的故障應變效率。

Reduce the sortation system downtime for preventive maintenance and enhance the system fault response efficiency.

團隊名稱 Team Name	袋袋相傳 Baggaholic
成立日期 Date of Formation	2017年4月 April 2017
業務單位 Business Unit	工程及維修部 Technical Services Department
部門促導員 Team Facilitator	周顯恩 Peter Chow
隊長 Team Leader	李卓鴻 Charles Li
團隊 Team Members	葉超頌 董鈺雯 陳舜揚 黎卓輝 Roy Yip Yumi Tung Tony Chan Vincent Lai

背景 BACKGROUND

行李分揀系統每天高效準確地將約10萬件行李分送到指定的行李裝箱區，確保行李準時送達各航班，所以是整個行李處理系統其中一個最關鍵部分。

行李分揀系統非常重要，如停止運作一分鐘，可導致行李處理系統有33件行李滯後，行李運送亦可能因而延誤，故此我們對維修保養投放大量時間及資源，以提高系統的可靠性。

我們每季進行預防性維修保養檢查，而檢查每部行李分揀器需時最多七小時。每天機場只有在凌晨1時至5時期間相對不太繁忙，檢查時間十分緊迫，因此我們開始尋找方法縮短檢查所需時間。

The baggage sortation system is one of the most critical systems of the baggage handling system (BHS) at the airport. It sorts around 100,000 bags per day efficiently and accurately to the designated make-up areas to ensure the baggage can be loaded to the aircraft on time.

Given the importance of the system, a minute system downtime can lead to 33 bags lagging in the BHS, leading to the possibility of delayed baggage. A considerable time and resources had been spent to maintain and improve its reliability.

Up to seven hours had to spend to check each sorter during the quarterly preventative maintenance tasks. Given a small window available between 1:00 am and 5:00 am every morning when the airport is less busy, the process was extremely time intensive. Hence, we started to look for ways for improvement as to reduce the time needed for this task.

問題成因 CAUSE OF THE PROBLEM

- 根據現有的維修保養程序，須每季以人手進行全面的分揀器機件檢查，以及直線電動機、靜電刷、卡車定位的校準測量
- 視乎分揀器的大小，維修團隊須約二至六小時完成該等部件的檢查及校準測量
- 雖然有一些原廠設備製造商手動工具協助進行維修保養工作，但利用這些工具及相關人力進行維修保養甚花時間，而且低成本效益
- 為提高維修保養標準及質素，並預防任何人為錯誤，必須計及各種考慮因素

- According to the existing maintenance procedure, a quarterly holistic sorter hardware checking and alignment measurement for linear motors, static brushes, T-cart position alignment shall be conducted manually
- The maintenance team requires approximate 2 to 6 hours to complete the inspection and alignment measurement for those components subject to the size of the sorters
- Although some OEM hand tools were provided to assist in the maintenance service, the time duration for maintenance using the OEM hand tools and associated manpower to deliver are significant, and not cost effective
- Consideration may always be arisen in upholding the quality of the maintenance standard preventing any humanity error

解決方法 SOLUTION

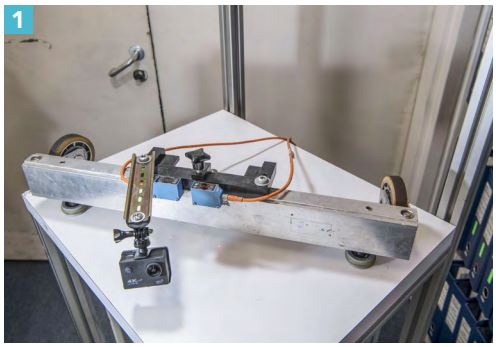
- 引入特製的智能分揀檢查工具，這個智能維護工具裝有高解像度攝影機及雷射測距感應器的可插入式底盤，方便使用
- 維修團隊進行預防性維修保養檢查時，可提高分揀系統部件定位的成效及準確性
- 大大減省預防性維修保養檢查所需的人力及時間（約70%）
- 由於分揀系統適用性提高，減少了出現故障的機會

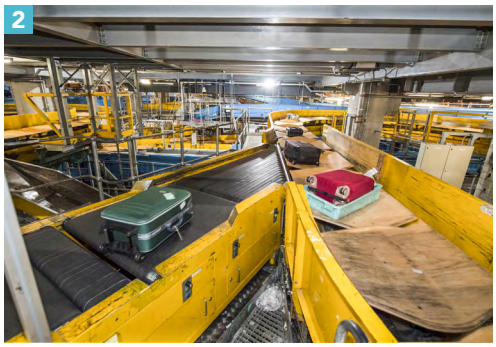
- Introduce a bespoken smart maintenance toolkit: "Smart-Sort-Checker", an user-friendly attachable chassis composing of high definition (HD) camera, laser displacement sensors
- The maintenance team can enhance the efficiency and accuracy in the inspection of sortation system component positions during preventive maintenance
- Significantly reduce/save the manpower and duration of time of such the preventive maintenance (reduced by 70%)
- Mitigate the occasions of fault incidents owing to sortation system serviceability betterment

成果及效益 ACHIEVEMENT & BENEFIT

- 維修保養程序更加高效且準確。這工具亦有助我們評估維修服務承包商的工作質素
- 我們藉着這個方案減輕前線維修保養人員的工作量及壓力，盡顯對他們的關心和理解
- 進行檢查時利用工具達到更準確的定位校準，大大增加分揀系統的運作時間
- 在系統上應用及結合新技術，為預防性維修保養工作建立實用和可持續的方案
- 盡量減少預防性維修保養工作所需時間，騰出更多空間進行系統更新及提升，從而使系統更可靠及可持續運作
- 我們與前線維修保養人員面談時，發現現時維修保養工作流程實際上的各種限制及挑戰，因此為他們研發及推行這個方案，並期望他們反映意見，令方案可更加完善

- The maintenance process was enhanced, not only more efficient, but also more accurate. The tool kit also helps us to evaluate the quality of work done from maintenance contractor
- The solution shows our care and understanding to the frontline maintenance staff by providing the solution to relax their workload and working stress.
- The system availability would be enhanced significantly by having the tool for more accurate alignment during the inspection
- New technologies had been applied and integrated into the system to build up the practical and sustainable solution for preventive maintenance
- Minimizing the amount of time requiring for preventive maintenance allows more maintenance window for system rejuvenation and enhancement works such that the system would become more reliable and sustainable
- By interviewing the frontline maintenance staff, we realize the actual limitations and difficulties of the existing maintenance work flow. We develop and implement the solution for them. We are keen on getting feedback from them to optimize our solution.





1 *智能分揀檢查工具俯視圖*
The overview of Smart Sorter Checker

2 *每天處理超過10萬件行李的分揀系統*
The Sortation System that handling over 100,000 bags daily

3 *進行預防性維修保養工作時使用智能分揀檢查工具的實際環境*
The actual environment on using Smart Sorter Checker during the preventive maintenance

優質個案

昇捷控股有限公司
Synergis Holdings Limited

新型自製手提式水浸警報器
Novel homemade portable flood alarm

團隊名稱 Team Name	太和圈 Tai Wo Circle
成立日期 Date of Formation	2002年 2002
業務單位 Business Unit	太和邨 Tai Wo Estate
部門促導員 Team Facilitator	劉鎮聲 Jason Lau
隊長 Team Leader	簡德昌 岑文標 Ken Kan Bill Shum
團隊 Team Members	羅俊昌 麥暉明 謝倩婷 陳詠琪 蘇雪盈 梁健恆 張德宗 葉映瑜 Rex Law Daniel Mak Zora Tse Vicky Chan Yennis So Hang Leung Terence Cheung Amy Yip

背景 BACKGROUND

位於大埔的太和邨樓齡屆30年，屋邨設施包括地底喉管等開始老化，間中會出現滲漏。當位處升降機底的地底喉管爆裂，導致嚴重滲漏時，升降機槽可能會出現積水及水浸，損壞升降機機件，升降機需停用待修。維修不但增加屋邨的財政負擔，升降機停用待修期間亦會為住戶帶來不便。

Facilities including piping of the 30-year-old Tai Wo Estate in Tai Po has been aging and would cause leakage problem from time to time. When one of the underground pipes beneath of lift shaft burst with serious leakage, it may cause water immersion and damages to the lift parts. Lift service would therefore be suspended for repairing. Frequent repairing would not only increase the financial burden of the estate, but also cause inconveniences to residents.

問題成因 CAUSE OF THE PROBLEM

- 升降機底的喉管老化問題不容易察覺，單靠升降機保養公司每兩個星期一次的日常升降機保養檢查，往往未能及時發現升降機槽有否積水及水浸。
- 屋苑沒有合資格技術員可自行升高升降機以進行槽底檢查。
- 傳統水浸警報器較為昂貴，亦不適合升降機槽環境使用。

- It is not easy, if not impossible, to detect aging problem of underground pipes beneath of lift shaft nor find out if there is any water or flooding in the lift shaft during the bi-weekly regular lift maintenance service.
- There is no qualified technician in the estate to operate the lift and perform the checking.
- Traditional flood alarms are expensive and not suitable to use in lift shaft.

Case Study

解決方法 SOLUTION

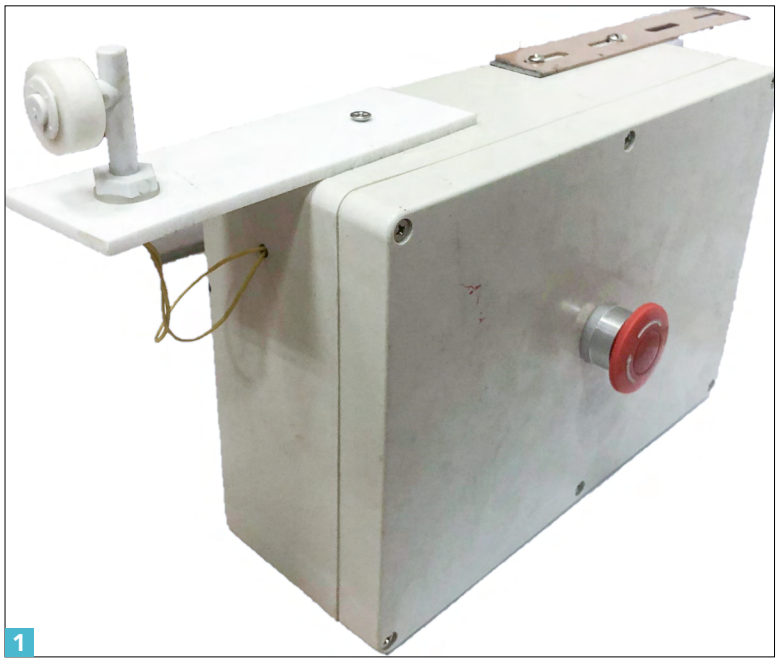
- 因應升降機槽底環境，工程部員工自行設計及製作手提式水浸警報器，7x24全天候監察機槽情況。
- 當警報器偵察到滲水情況，警報顯示屏會亮燈及發出聲響，通知職員跟進。

- Technical staff designed and made a portable flood alarm to suit the lift environment. It provides 7x24 monitoring.
- When water comes in contact with the sensor, it activates the alarm at the security control room. The blinking light and an audible sound would alert the staff in charge to follow up.

成果及效益 ACHIEVEMENT & BENEFIT

- 減低升降機槽底積水損壞升降機零件的風險。
- 減少維修升降機的支出，同時亦減輕屋邨財政負擔。
- 減少升降機停用待修對業戶帶來的不便。
- 新水浸警報器物料及裝置費用便宜，較傳統類似功能的設備優勝。
- 法團及住戶讚賞創意。

- Reduce the risk of lift parts damage by water at the bottom of the lift shaft.
- Reduce lift repairing cost as well as the financial burden of the estate.
- Reduce the inconveniences caused by lift service suspension.
- The new device is cheaper but more superior than the traditional product.
- Appreciated by the incorporated owners and residents.



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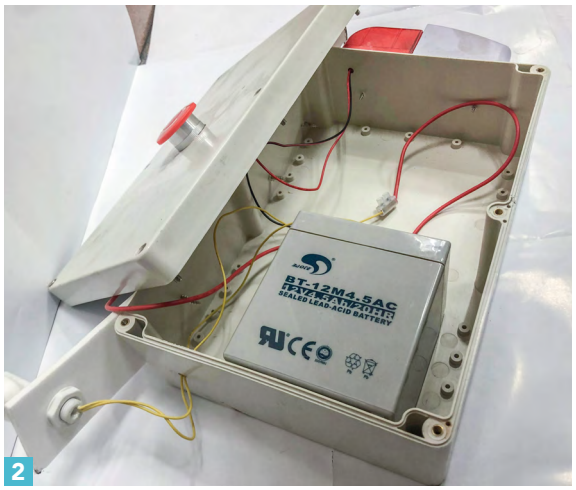


2

1 *新型自製手提式水浸警報器*
Novel homemade portable flood alarm

2 *新水浸警報器的設計並不複雜，但功能較傳統類似功能的設備優勝。*
The design of the new device is not complicated, but its performance is much better than similar products.

優質個案

煤氣 Towngas

香港中華煤氣有限公司
The Hong Kong and China Gas Co. Ltd.

智 慧 倉 庫
Smart Warehouse

團隊名稱 Team Name	智慧倉庫 Smart Warehouse
成立日期 Date of Formation	2017年12月 December 2017
業務單位 Business Unit	企業物料供應及行政部 Corporate Supplies and Administration Department
部門促導員 Team Facilitator	招國來 Chiu Kwok Loi Ricky
隊長 Team Leader	吳潘偉 Ng Pun Wai Parry
團隊 Team Members	譚梓洋　鍾敬華　陳貴榮　黃定聰 林典煥　廖浩文　余維雄 Tam Tsz Yeung Dicky　Chung King Wah Chen Kwai Wing　Wong Ting Chung, Antonio Lam Tin Wun　Liu Ho Man, Michael Yu Wai Hung

背景 BACKGROUND

目前煤氣公司的倉庫正面臨退休潮、現職員工年紀漸趨老化和招聘困難等難題。公司的業務亦日趨多元化，積極拓展電商市場。為了解決以上難題，支援公司業務發展和保持競爭力，公司倉庫必須透過建立和實踐「智慧倉庫」方案去實行自動化和智能化。利用最新的科技和設備，重新規劃操作流程和減少人力搬運，從而提升整體效率。

Warehouses of HKCG currently experience several difficulties such as wave of retirement, an ageing population and difficulty in recruitment. Meanwhile, business scope of HKCG is also getting diversified and actively expands into e-commerce market. In order to solve the above problems, support company's business development and maintain competitiveness, warehouses are automated and digitized through the establishment and implementation of a "Smart warehouse" solution. Overall efficiency is improved by redefining processes and reducing manual handling with the help of latest technology and equipment.

問題成因 CAUSE OF THE PROBLEM

- 沒有流動性設備
- 沒有資訊網絡基礎建設
- 人手核對燃氣爐具

- Lack of Mobile Device
- Lack of Network Infrastructure
- Manual Checking of Gas Appliance

Case Study

解決方法 SOLUTION

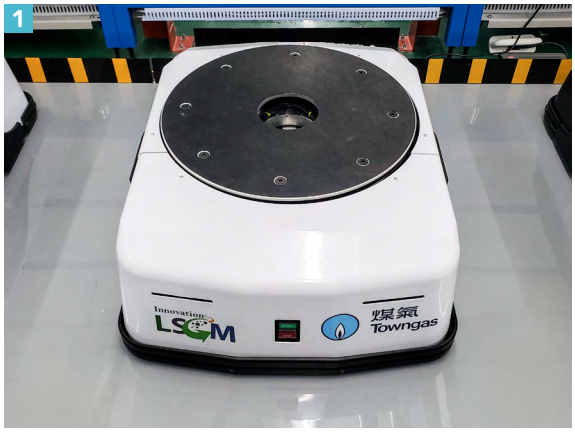
- 配合SAP 建立自動導引運輸車系統(AGV)，利用自動機械搬運貨架至指定工作地點
  - 透過AGV和倉管系統的配合和地面標誌的定位，AGV系統能讀取區域內所有貨物的存貨量和分佈。
  - 按照揀貨單，AGV自動把指定貨架搬運到工作平台。揀貨人員在固定位置作業，消除揀貨程序中的運輸行走時間及減少人力資源。
- 利用SAP Fiori技術，編寫一個適用於爐具揀貨的流動應用程式
  - 把倉管系統連接平板電腦上，加強流動性，簡化文件處理和核對貨物程序。倉庫同事能利用平板電腦處理倉庫工作的日常流程及實時更新庫存資料，查詢爐具數量、儲存位置和歷史動態。
  - 配合著掃描器和爐具包裝上的QR標簽，同事們能於應用程式上完成揀貨和點貨程序。

- Develop an "Automated guided vehicle" system interacting with SAP, using automated machine to deliver racks to designated locations
  - Through cooperation of AGV and warehouse management system and navigation using special markings on the ground, AGV system can identify inventory level and storage location of all goods in the area.
  - According to picking lists imported from SAP, AGV automatically picks up and delivers required racks to designated work stations. Staff works in one location only, eliminating travel time and reducing human resources required in the picking process.
- Develop a mobile application for appliance picking using SAP Fiori technology
  - This application connects warehouse management system with mobile tablets to enhance mobility, simplify documentation and clicking procedure. Warehouse staff can use tablets to handle routine works, update system data in real time and check inventory level and storage location of appliance and its movement record.
  - With scanner and QR label on the package, staff can perform and complete picking and checking processes on the application.

成果及效益 ACHIEVEMENT & BENEFIT

- 自動導引運輸車系統
  - AGV自動把貨物送至揀貨員面前，大大減少員工的行走時間。工作平台上的拍燈系統為員工提供清晰的指示，加快流程並減少出錯機會。
  - 有了這個系統的幫助，每周工作時間減少了52工時。
- 爐具揀貨的應用程式
  - 程式的應用成功於倉庫推行無紙化，提高職安健水平，提升揀貨準確度和效率，並加強貨物追溯性。
  - 由於簡化文件處理流程和減省了核對工序，每天爐具揀貨工序減省了30分鐘。

- Automated Guided Vehicle (AGV) system
  - AGV automatically delivers the goods to warehouse staffs, significantly reducing their walking time among racks. "Pick to Light" system on the work stations provides clear instructions to staff, speeding up picking process and reducing opportunities of making error.
  - With the assistance of this system, weekly working time is reduced by 52 man hours.
- Appliance picking mobile application
  - This application succeeded in the implementation of "paperless" concept in warehouse, strengthening occupational safety and health, enhancing accuracy and efficiency of picking, and enhancing traceability of appliance.
  - Entire daily appliance picking process is reduced by 30 minutes due to streamlined document handling process and eliminated checking procedure.



1 *自動導引運輸車 Automated Guided Vehicle*

2 *Fiori爐具揀貨應用程式 Fiori Appliance Picking Application*

優質個案

港鐵公司
MTR Corporation

減少將軍澳S700KM轉轍機制動鎖件於維修時的更換次數
Reduction in the Number of Replacements of Pawl Locking Housing of TKL S700KM Point Machine during Overhaul

團隊名稱 Team Name	活力圈 Active Circle
成立日期 Date of Formation	2018年3月 March 2018
業務單位 Business Unit	鐵路車輛維修部 Rolling Stock Maintenance Department
部門促導員 Team Facilitator	杜雲鵬 To Wan Pang
隊長 Team Leader	翁顯揚 Yung Hin Yeung
團隊 Team Members	陳國華　陳閩　鄭全其　張遠光　鄺偉雄　蔡培城 Chan Kwok Wah　Chan Man　Cheng Chuen Kay　Cheung Yuen Kong　Kwong Wai Hung　Tsoi Pui Shing

背景 BACKGROUND

同事在進行大修時，發現將軍澳綫S700KM波口機經長時間使用後，鎖件的表面會出現嚴重磨蝕，需要更換全新的鎖件導致開支增加。活力圈團隊於是構想出一套有效的方法，在保持安全質素的同時，又可以善用資源，減少棄置制動鎖件。

During the overhauls, colleagues had observed that excessive abrasion would occur over a long period of time in the pawl locking housing of Tseung Kwan O Line S700KM Point Machines, which incurred expenses for replacement parts. The Active Circle team came up a new solution to reduce wastageand fully utilise resources while also maintaining the quality of the components.

問題成因 CAUSE OF THE PROBLEM

- S700KM波口機在進行波口轉動時，其金屬鎖緊桿會移動，與制動鎖件的表面產生磨擦，造成損耗。由於鎖緊桿由較硬的鋼鐵製成，而制動鎖件是由較脆弱的鋁青銅合金製成，經長時間使用，鎖件的表面會出現嚴重磨蝕。
- 在進行大修時，同事要檢查制動鎖件的表面。如出現過度磨損，便要更換全新的鎖件，並棄置原有的鎖件，導致每年購買新鎖件的開支龐大。

- When S700KM point machine operates, its metal locking rod moves, and causes friction with the pawl locking housing surface, resulting in metal loss. Since the locking rod is made of harder steel, and the pawl locking housing is made of a more fragile aluminum bronze alloy, the surface of the lock will have severe abrasion over a long period of time.
- During overhaul, the team is required to check the surface of the pawl locking housings. If excessive abrasion occurs, new locks are replaced, and the original locks are discarded, resulting in a considerable annual expense of purchasing new locks.

解決方法 SOLUTION

- 同事仔細研究制動鎖件的產品說明書後，訂出更換制動鎖件的新標準，再與信號及設計組同事確認在制動鎖件符合標準的情況下，可經打磨後（減少接觸面摩擦帶來的磨損）重用。
- 基於上述新標準，制動鎖件的磨蝕厚度由單一接受標準少於0.5mm，改為複合接受標準少於1.5mm。
- 在新標準下，2016和2017年需棄置的制動鎖件分別由75%減至10%和100%減至0%。由於制動鎖件的壽命延長，每年更換鎖件的預計開支得以大大減少。

- After carefully studying the product manual, the team set new standards for replacing the pawl locking housings and confirmed with the Signal and Design Team that the pawl locking housings can be reused after polishing (reducing wear caused by friction on the contact surface) if they meet the standards.
- Based on the above new standards, the abrasion thickness of the pawl locking housings changed from less than 0.5 mm by a single acceptance standard to less than 1.5 mm by a compound acceptance standard.
- Under the new standard, the pawl locking housings disposed in 2016 and 2017 were reduced from 75% to 10% and 100% to 0% respectively. Due to the extended life of the pawl locking housings, the estimated expenditure of replacing the locks per year is greatly lowered.

成果及效益 ACHIEVEMENT & BENEFIT

有形得益

- 每年購買全新制動鎖件的成本可節省約港幣2,195,506元（即：港幣59,338
- 元 x 每年37 套制動鎖件）。
- 打磨一套PAWL道岔的制動鎖件的時間約30分鐘，即每年額外增加了18.5小時工時，約港幣4,255元的工資。
- 提案回本期只需約3天。

無形得益

- 優質服務：新修訂的標準能減少浪費部件，物盡其用，有效運用資源。
- 互敬互重：圈員透過提出本提案明白到多方溝通和了解對團隊工作和解決問題的重要性。
- 創造價值：延長制動鎖件的壽命，為公司減少開支。
- 勇於進取：圈員主動研究延長制動鎖件壽命的方法，勇於思考改善現況的做法。

Tangible Benefits

- The cost of purchasing a new pawl locking housing per year can be saved about HKD2,195,506 (i.e. HKD59,338 x 37 sets).
- It takes about 30 minutes to polish a pawl locking housing, i.e. an additional 18.5 hours of work and a wage of about HKD4,255 per year.
- The payback period is only 3 days.

Intangible Benefits

- Excellent service: The newly revised standards can reduce wastage and fully utilize resources.
- Mutual respect: The team understands the importance of communication, teamwork and problem solving.
- Value creation: The life of the pawl locking housings is extended to save costs.
- Enterprising spirit: The team has taken the initiative to study ways to extend the life of the locks and seek improvements.

已打磨的制動鎖件正進行閉合衝程測試
The polished pawl locking housing is being tested for a closed stroke

優質個案

金城營造集團
Kum Shing Group

無人機航拍系統於架空電纜巡視工作的應用
Unmanned Aircraft System (UAS) Application in Overhead Line Inspection

團隊名稱 Team Name	飛俯視野 Vision Flight
成立日期 Date of Formation	2018年9月 September 2018
業務單位 Business Unit	電網工程部 - 架空電纜項目 Electrical Services Department - Overhead Line
部門促導員 Team Facilitator	陳爾駿 Karson Chan
隊長 Team Leader	陳爾駿 Karson Chan
團隊 Team Members	丘兆貴　陳正順　謝春源 郭永賢　黃國浩 S. K. Yau　Ivan Chan Benson Tse　Corner Kwok Raymond Wong

背景 BACKGROUND

數十年，架空電纜工人一直以目測的傳統方式檢測架空電纜。然而，工人老化、人力資源短缺、營運成本增加及潛在的安全隱患，為傳統檢測帶來不少挑戰。有見及此，金城採用了無人機航拍系統及最新技術改善及提升施工安全、效率及效益。

由無人機航拍系統所拍攝的高解像度影片及進行的攝影測量有助偵測損壞的組件，而紅外線檢測則可識別電纜系統的異常情況。此外，人工智能亦可偵測組件缺陷並將缺陷分類，協助工程人員精準修補破損組件，檢查結果更準確、工作效率更高。

Traditional manual overhead line inspection has been adopted for decades. However, with current limitations like aging workforce, shortage of manpower, high operation cost and safety hazards, the application of the "UAS" and the latest technologies are adopted to improve safety, working efficiency and effectiveness.

High definition videos and photos surveys are used to identifying physical defects, whereas thermograph survey is used to spot abnormal condition in the power line system. With the help of Artificial Intelligence (AI) model, defects are identified and classified into different categories for easier handling. Human judgmental errors can be minimized and reliability and efficiency can be enhanced.

問題成因 CAUSE OF THE PROBLEM

- 架空電纜工人年紀老化
- 營運成本上升
- 高空工作及長時間於戶外工作引致健康安全問題
- 地面目視檢查不夠準確和全面
- 遠距離檢測準確性低

- Aging workforce
- Increasing operation cost
- Safety and health problems (working at height and exposure under sun)
- Limited effective range and inspection angle of visual inspection on ground
- Low accuracy rate due to long distance

Case Study

解決方法 SOLUTION

- 以無人機航拍系統取締地面目視檢查
- 以4K超高清解析度視頻及紅外線攝影測量偵測損壞的組件
- 以紅外線檢測識別電纜系統的異常情況
- 以人工智能進行偵測，協助工程人員精準修補破損組件
- 重要數據如GPS座標、檢查日期、視頻及影像會被紀錄下來，以供參考，可用於預防性維護分析

- Replacement of human inspection by the UAS system
- Adoption of high definition videos (4K) and photogrammetry to identify physical defects
- Adoption of thermographic survey to spot abnormal condition in the power line system
- Adoption of Artificial Intelligence (AI) model to identify defects and to reduce human judgmental errors
- The recorded key data like GPS coordinates, inspection date, videos and photos can be reviewed anytime and can create data base for preventive maintenance analysis

成果及效益 ACHIEVEMENT & BENEFIT

檢測層面

- 變得更安全、更高效率，以及更省時
- 結果更準確
- 所收集的數據可用於預防性維護分析

Operational Level

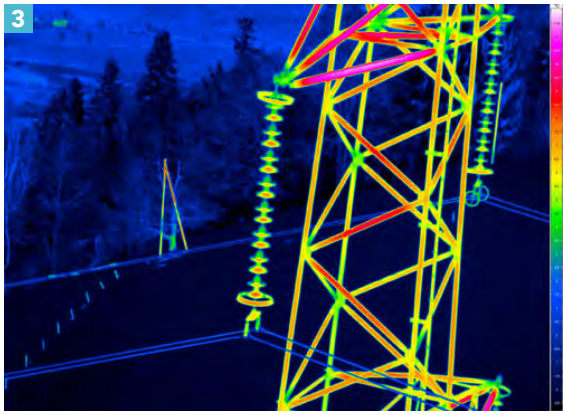
- Enhance safety, operation efficiency. Inspections now become less time-consuming
- Enhance the reliability of the inspections
- Provide data base for preventive maintenance analysis in the future

企業層面

- 為客戶提供可靠的服務，切合他們所需
- 培養及加強企業創新文化

Corporate Level

- Provide reliable service to meet clients' expectation
- Nurture and strengthen innovative culture of the corporation



1 *航拍系統取締目視檢查*
Replacement of human inspection by the UAS system

2 *巡查更安全更高效*
Enhance safety, operation efficiency. Inspections now become less time-consuming

3 *使用紅外線溫度偵測損壞組件*
Adoption of thermographic survey to spot abnormal condition in the power line system

鳴謝
Acknowledgement

承蒙下列單位/ 人士的鼎力協助/ 支時，2019年優質改善經驗交流會得以圓滿舉行，謹此衷誠致謝。

We would like to express our sincere thanks to the following parties/ individuals for their dedicated efforts and generous support in making the Quality Improvement & Experience Sharing Convention 2019 a tremendous success.

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Advisory Panel

大會評判
Panel of Judges

大會司儀
Masters of Ceremony

發佈隊伍
Presentation Teams

優質活動聯絡人
Company Representatives

所有曾提供協助的人士
All those who have been of any support to the event

以下機構為本活動提供額外贊助，專此鳴謝。

Special thanks to the following organizations for the sponsorship they provided for the event.

紀念品及禮品 | Door Gifts

金城 KUM SHING 1963 | 美心 Maxim's | Pfizer 輝瑞

攝影及影片拍攝 | Photography and Video Shooting

金城 KUM SHING 1963 | MTR

觀察者 | Observers

港燈 HK Electric | 美心 Maxim's

支持機構 | Supporting Organization

HKqma Hong Kong Quality Management Association 香港品質管理協會 | Pfizer 輝瑞

致意 WITH COMPLIMENTS

主辦機構 | Organizer

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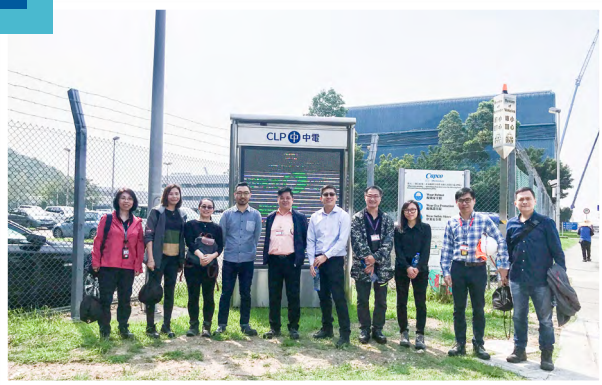
策劃及工作委員會全體成員
Members of Organizing Committee

2019年
優質改善經驗交流及借鑑活動花絮
Quality Experience Sharing and Benchmarking Activities 2019

17 APRIL 2019

參觀龍鼓灘電廠新建D1燃氣機組項目
Kum Shing Group CCRT D1 Project Visit



29 MAY 2019

優質改善經驗交流會午宴
"Quality Through Innovation" Seminar Luncheon

21 AUGUST 2019

參觀美心西餅麵包廠
Maxim's Cake & Bakery Factory Visit

11 OCTOBER 2019

參觀國泰航空飲食服務中心
Cathay Pacific Catering Services Centre Visit

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2019

持 續 創 新　　優 質 雋 永

Creativity and Innovation for Quality Excellence