出國報告:(出國類別:其他)

「第二航廈行李暫存區及北登機廊廳行李輸送系統改善工程」 高速小車系統設備國外廠驗報告

服務機關:桃園國際機場股份有限公司

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派赴國家:丹麥、挪威

出國期間:114年9月6日至114年9月14日

報告日期:114年9月25日

摘要

近來隨著經濟成長及疫情後之旅運量大幅增長,並考量第三航廈北登機廊廳預計於 115 年啟用,後續所增加航廈間之行李量,及現行第二航廈行李處理巔峰時段之緩解,本公司於 112 年即啟動辦理本計畫之工程設計、發包等作業,本工程主要範疇包含遷移地下行李處理場北邊轉機行李斷層掃描儀及建置主體行李暫存區,並增設北登行李輸送機回流線,以改善北登及主體行李處理場之連結,使整體運作更為順遂。

本工程透過利用舊式輸送線拆除連接至主體早到暫存區活化之空間,增修主體分揀機及小車行李儲存系統,以紓解尖峰時間行李輸送壓力,並優化第二航廈北登機廊廳控制中心設備、強化資安等及符合資通安全管理法需求,於整體效益上,增設及改建之行李暫存區可容納約600件以上之早到行李,且系統亦是採高速小車(下稱ICS,Individual Carrier Systems),每小時450件以上之行李運送容量,提升行李儲存緩衝空間,加強系統處理效能,並可作為自助託運早到行李暫存使用,降低分揀系統之行李壅塞機率,提昇旅客報到作業效率。

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壹、目的

為降低桃園國際機場第二航廈地下行李處理場行李處理作業擁塞情形及主體早到行李暫存 區不敷使用等情形,桃園國際機場公司於113年辦理「第二航廈行李暫存區及北登機廊廳行李輸 送系統改善工程」〈以下簡稱「本案」〉。

本案所設置一組高速小車存儲系統、ICS控制系統及3組貨架式早到行李儲存系統,其相關設備主要功能為提升早到行李暫存系統至684儲位,以達到第二航廈行李處理系統之自動化、實現轉機與預辦登機行李之智能存取並提高航空公司及地勤公司處理行李卸載效率。

此次行程主要執行廠驗任務,本案採用BEUMER Group的高速小車ICS系統(型號:CrisBag®)及貨架式早到行李儲存設備(型號:CrisStore®)之相關行李設備製造廠位於丹麥,赴丹麥進行交貨前廠驗工作,了解和驗證相關設備的運行功能。期間參訪了BEUMER GROUP 的製造部門,了解其製造程序,並安排實地驗證挪威奧斯陸機場及丹麥哥本哈根機場,了解該套系統於機場行李處理之整合狀況;同時了解挪威奧斯陸機場最新完成之ICS行李處理系統相關設施建設情形,以利未來本機場既有行李處理設備之汰換/更新之參考依據。

貳、 過程

一、 廠驗行程

表 1 廠驗行程表

項次	日期	活動內容
第一天	2025/09/06(六)	移動日:桃園>杜拜>丹麥(哥本哈根)
第二天	2025/09/07(日)	移動日:丹麥(哥本哈根)>丹麥(奧胡斯)
第三天	2025/09/08(一)	廠驗
第四天	2025/09/09(二)	廠驗
第五天	2025/09/10(三)	廠驗,丹麥(奧胡斯)>挪威(奧斯陸)
第六天	2025/09/11(四)	參觀奧斯陸機場(實地驗證),挪威(奧斯陸)>丹麥(哥本
		哈根)
第七天	2025/09/12(五)	參觀哥本哈根機場(實地驗證)
第八天	2025/09/13(六)	回程,丹麥(哥本哈根)出發
第九天	2025/09/14(日)	因換日線時差,09/14抵達桃園

二、 廠驗人員名單

表 2 廠驗人員名單

序號	姓名	服務單位	職稱
1	陳泰嫈	桃園國際機場股份有限公司	副處長
2	黄宇民	桃園國際機場股份有限公司	工程師
3	黎振宇	桃園國際機場股份有限公司	工程師
4	張香盛	台灣世曦工程顧問股份有限公司	監造主任
5	張志懋	廣運機械工程股份有限公司	協理
6	藍大為	廣運機械工程股份有限公司	專案經理
7	林瑾禾	廣運機械工程股份有限公司	品管工程師
8	林怡芬	金怡合企業股份有限公司	總經理
9	羅美惠	金怡合企業股份有限公司	工程師
10	廖經銘	金怡合企業股份有限公司	工程師

三、 廠驗設備介紹

本工程(「第二航廈行李暫存區及北登機廊廳行李輸送系統改善工程」)目的係優化第二航 厦行李處理效能,提升營運穩定度及設備韌性,其中包含各區行李輸送線之優化改善、主體北邊 增設高速小車ICS早到行李儲存區,及第二航廈北登行李系統控制中心改善等,此次廠驗標的為本工程之高速小車ICS系統(型號:CrisBag®),為確保交付裝載之設備符合本案功能規格需求,其主要內容及功能如下:

(一) 高速小車系統(Individual Carrier System, ICS)

(1) 型號:CrisBag®

1. 組件及數量:

● ICS裝載站:2组ICS

● 排出站:2组

● 存取機:3部

● 早到行李存儲位:684個

裝載托盤:734個



圖 1 高速小車(ICS)行李輸送系統 CrisBag®

2. 模組化設計:

CrisBag®系統由許多不同樣式的部件組合而成,包含直線輸送機構、轉彎機構、合併機構、分撥器(diverters)等,這些部件組合成完整的行李處理系統。系統可針對每個工程而量身訂做,以滿足行李吞吐量、輸入/輸出數量或特定需求。

採取模組化系統,單獨控制每組小車托盤(totes), 高度模組化的概念涵蓋整

個機械、控制系統、電氣及纜線配置中,能夠提供不同規模的行李處理系統。

3. ICS小車與行李尺寸:

本工程提供「裝載標準行李的小車托盤(SBT)」,其標準行李尺寸如下:

a.長度:150mm ~ 900mm

b. 寬度: 75mm ~ 750mm

c.高度:75mm ~ 550mm

d.重量:1kg ~ 50kg。

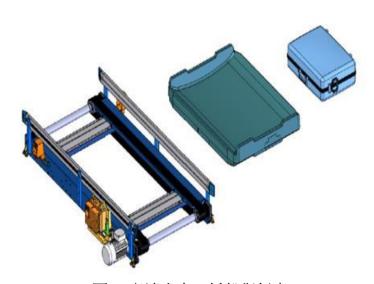


圖 2 高速小車、托盤與行李





圖 3 貨架式早到行李儲存系統(EBS)CrisStore®

4. 整合早到行李儲存:

CrisBag®系統的一個特色是早到行李存放(EBS)。EBS提供長期儲存行李的可能性,同時可以解決高峰期行李量,並可以根據航班起飛時程來安排儲存位置。 單件行李可以查詢其儲位並調出,例如旅客在託運後需要拿取行李中的物品,或旅客改搭其他航班時。

5. 行李識別:

在行李被裝載入小車前,會經過自動條碼讀取設備(automatic tag reader, ATR),來識別10碼的IATA行李編號。

每個小車(tote)都有RFID標籤,裡面儲存有小車托盤的ID number。行李裝載 入小車之後,「IATA行李編號」與「小車托盤ID號碼」會經由控制系統配對,從 裝載開始,直到行李離開小車為止,都會以小車托盤的ID號碼來進行識別。透過 這個方式,控制系統能夠追蹤到CrisBag®中的任何行李,可以省下大量行李辨識的時間。

6. 行李追蹤:

控制系統保持對ICS小車完全的監控,能夠在任何時間追蹤單件行李的位置。 維運人員可以透過控制系統找到行李當前位置,或設定行李通過預設的追蹤點時, 自動進行回報。

這種方法確保100%準確追蹤整個系統中的小車和行李位置,並且可以隨時停止任一線路,並於重新啟動後,仍然完整監控所有行李。

RFID天線設置於輸送機構之間,並安裝在橫桿上,以驗證行李所在位置,並確保在按下緊急停止鈕(e-stop)並復歸後,立即恢復追蹤。

7. 預防保養:

CrisBag®系統,提供預防性維護保養的建議。從而降低因為磨損而導致計畫 外系統停止的風險。

CrisBag®系統的檢查和維護是根據預訂時間表和每個單獨元件的具體使用率來進行的。原廠提供檢修手冊詳述每個組件的維護保養頻率,可能是每6週、每月、每年或累積一定數量後。

除了維護保養頻率之外,該檢修手冊還詳細描述如何對各種組件進行正確的維護。

8. 產品生命週期:

如果機組放置在室內,一般部件的使用年限約為15年;易耗損品使用期為50,000小時;軸承(bearing)使用期為70,000小時。

前述保用期,僅適用於確實執行預防性維護保養作業的情況下。

(二) BEUMER GROUP A/S 公司簡介說明

BEUMER集團是國際知名室內物流(智能物流、物流自動化)龍頭,在搬運、裝卸、包裝、 分揀、配送技術上領先全球。集團員工約4,000人,年營業額達7億歐元。集團散布全球超 過70個國家,業務涵蓋機場、石化工業、食品飲料、醫藥、包裝包裹、郵購、多媒體。曾 獲得德國經濟週刊雜誌排行第五、德國百大創新公司、德國企業道德獎、2015年度最佳雇 主、Axia獎項等。

BEUMER最初於1935年成立於德國,2009年收購丹麥Crisplant公司,結合兩個世界最知名的材料處理、室內物流品牌,提供全球客戶一流的解決方案。2016年5月,兩個集團品牌整併,以BEUMER為名,提昇綜效,為客戶提高更多價值。

BEUMER的核心原則為:「看重長遠的成功而不是短期利潤。」為了達到這個目標,集團需保持高度發展性和培養值得信賴的合作關係,核心價值表現在「對產品的責任感」和「對自然環境的保護」。因此嚴肅看待「產品設計的效率」、「先進技術的研發」、「環境汙染和風險的防範」、「員工的專業訓練」、「管理系統和定期組織審核」等。

BEUMER截至2024年止,BHS的機場實績遍佈全球41個國家,超過130座機場。根據ACI組織2024年機場服務評比(ASQ),超過4000萬年旅客運量國際機場排名,包括第一名的杜拜國際機場,第二名的倫敦希思羅機場、第三名的南韓仁川機場(ICN)等均廣泛採用BEUMER BHS設備,可見其為國際機場BHS專業中首屈一指的專業供應商。

(三) BEUMER 機場 BHS 主要設備實績

在供應廠商之製造、供應或承作能力實績經驗方面,BEUMER全球機場實績已安裝超過 1,500組分揀機系統(Sorter),tilt-tray與cross-belt分揀機市佔率全球第一,摘要說明 如下圖:

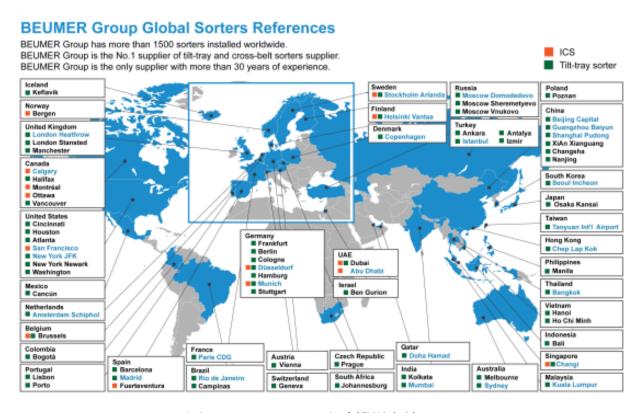


圖 4 BEUMER Group 全球機場實績

本工程將採用最新式獨立行李載具(Independent Carrier System, 簡稱ICS)之高速 小車ICS系統處理出境行李及轉機行李(Transfer Baggages)/早到行李(Early Baggages), BEUMER主要國際機場現行採用最多之傾翻盤行李分揀系統(Tilt-TraySystem, 簡稱TTS) 與最新式高速小車ICS系統供應設置實績摘要如下表:

表 3 BEUMER Group 全球機場實績

			Role		ole
Country	Airport	Supply	Completed	Subcontractor	Main contractor (BHS)
AE	Abu Dhabi MTB	BHS with CrisBag® and CrisBelt® system with controls	2019		х
AE	Dubai International Airport, T2	Tilt-tray sortation system with controls	2012	Х	
AE	Dubai International Airport, Crew Terminal	autover®, cold standby controls system, BeOS	2007	X	
AT	Salzburg Airport, T2	BHS (high-speed pushers)	2005		Х
AT	Vienna Airport, Skylink	Tilt-tray sorter Tilt-tray sorter	2006 2007	X	
AT	Vienna Airport	Tilt-tray sorter	2004	х	
AT	Vienna Airport	Tilt-tray sortation system with controls Note: The system has been de-commissioned.	1992	X	
AU	Melbourne International Airport, T2	BHS with CrisBag®, EBS and Conveyor including CSC & CMC controls	2027		х
AU	Melbourne International Airport	Tilt-tray sortation system with controls	2010	X	
AU	Sydney Airport, T3	Tilt-tray sortation system with controls	2006	х	
AU	Sydney Airport, T1	Tilt-tray sortation system with controls	2000	Х	
AU	Sydney Airport	2 tilt-tray sorters	1998	Х	
AW	Aeropuerto Internacional Reina Beatrix, Aruba	BHS with CrisBag® and CrisBelt including controls	2022		Х
BE	Brussels Airport, Pier A	BHS with CrisBag® tote system and controls (SAC)	2006		х
BE	Brussels Airport, A	Tilt-tray sorter	1993	х	
BE	Brussels Airport, B	Tilt-tray sorter	1993	X	
BR	Campinas Viracopos Airport	BHS with tilt-tray sorter (LS-4000E), CrisBelt® and controls (SAC)	2015		X
BR	Rio de Janeiro	Tilt-tray sorter	1998	X	
CA	Calgary International Airport (DTB)	CrisBag® tote system for outbound including transfer and arrival system and integrated HBS	2019	Х	

Airport CA Calgary International Airport (ITB) CA Calgary International Airport (North & Central Terminal) CA Calgary International Airport (North & Central Terminal) CA Halifax Airport CA Halifax Airport CA Montréal Airport CA Ottawa Airport CA Ottawa Airport CA Toronto Airport CA Toronto Airport CA Toronto Airport CA Vancouver Airport CA Vancouver Airport CA Geneva International Airport CH Geneva International Airport CH Geneva International Airport CH Geneva International Airport CN Beijing Capital International Airport CN Changsha Airport CN Guangshou New Balyun Airport CN Shanghai Pudong Airport, T1 CN Shanghai Pudong Airport, T2 CN Shanghai Pudong Airport, T1 CN Shanghai Pudo					Ro	ole
(ITB) including transfer and arrival system and integrated HBS CA Calgary International Airport (North & Central Terminal) CA Halifax Airport	Country	Airport	Supply	Completed	Subcontractor	
(North & Central Terminal) CA Halifax Airport	CA		including transfer and arrival system and	2016		x
CA Montréal Airport CrisBag® tote system with controls 2011 x CA Montréal Airport, Transborder autover®, hot standby control system, BeOS 2009 x CA Ottawa Airport CrisBag® tote system with controls 2015 x CA Toronto Airport BHS with CrisBag®, CrisStore and CrisBelt®, including upper and lower-level controls 2020 x CA Toronto Airport CrisBag® tote system with controls 2020 x CA Vancouver Airport CrisBag® tote system with controls 2020 x CA Vancouver Airport 3 tilt-tray sorters (north, south and link) 2007 x CH Geneva International Airport Tilt-tray sorters (upper and lower, east and west) 2007 x CN Beijing Capital International Airport Tilt-tray sorters (upper and lower, east and west) 2000 x CN Changsha Airport BHS (LS-4000E) including controls 2000 x Airport T2 CN Changsha Airport BHS with tilt-tray sorter conveyor integration and controls (SAC) for out-/inbound/transfer CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls 2008 x CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 2008 x CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 2008 x CN Shanghai Pudong Airport, T1 Tilt-tray sorter and entire controls 2008 x CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 2012 x CN Shanghai Pudong Airport, T3 Tilt-tray sortation system with controls 2012 x CN Shanghai Pudong Airport, T3 Tilt-tray sortation system with controls 2012 x CN Shanghai Pudong Airport, T3 Tilt-tray sortation system with controls 2012 x CN Shanghai Pudong Airport T3A Tilt-tray sortation system with controls 2012 x CN Shanghai Pudong Airport T3A Tilt-tray sorter (LS-4000E), conveyor (CrisBelt) and entire controls (SAC) CN Prague Airport Tilt-tray sorter CN Prague Airport Tilt-tray sorter	CA		Redevelopment of control system	2011		x
CA Montréal Airport, Transborder autover®, hot standby control system, BeOS 2009 x CA Ottawa Airport CrisBag® tote system with controls 2015 x CA Toronto Airport BHS with CrisBag®, CrisStore and CrisBelt®, including upper and lower-level controls 2020 x CA Toronto Airport CrisBag® tote system with controls 2020 x CA Vancouver Airport CrisBag® tote system with controls 2020 x CA Vancouver Airport 3 tilt-tray sorters (north, south and link) 2007 x CH Geneva International Airport Tilt-tray sortation system with controls 1994 x CN Beijing Airport, T3 4 tilt-tray sorters (upper and lower, east and west) CN Beijing Capital International Airport T2 CN Changsha Airport BHS (LS-4000E) including controls 2000 x CN Guangzhou New Baiyun Airport BHS with tilt-tray sorter conveyor integration and controls (SAC) for out-/inbound / transfer CN Nanjing Airport BHS (LS-4000E) including controls 2014 x CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls (SAC) CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 1999 x CN XiAn Xianguang Airport T3A Tilt-tray sortation system with controls 2012 x CD Bogotá Eldorado International Airport Tilt-tray sorter (LS-4000E), conveyor (CrisBelt) and entire controls (SAC) CP Prague Airport Tilt-tray sorter CE Prague Airport Tilt-tray sorter CIL-4000E, conveyor 2013 x CD Berlin-Brandenburg Airport 2 tilt-tray sorter CIL-4000E, conveyor 2015 x	CA	Halifax Airport		2015		x
CA Ottawa Airport CrisBag® tote system with controls 2015 x CA Toronto Airport BHS with CrisBag®, CrisStore and CrisBelt®, including upper and lower-level controls CA Toronto Airport CrisBag® tote system with controls 2020 x CA Vancouver Airport 3 till-tray sorters (north, south and link) 2007 x CH Geneva International Airport Tilt-tray sorters (upper and lower, east and west) CN Beijing Airport, T3 4 till-tray sorters (upper and lower, east and west) CN Beijing Capital International Airport Tilt-tray sorters (upper and lower, east and west) CN Changsha Airport BHS (LS-4000E) including controls 2000 x CN Guangzhou New Baiyun Airport BHS with tilt-tray sorter conveyor integration and controls (SAC) for out-/inbound / transfer CN Nanjing Airport BHS (LS-4000E) including controls 2014 x CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls 2008 x CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 2012 x CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 2012 x CN Shanghai Pudong Airport T3A Tilt-tray sortation system with controls 2012 x CO Bogotá Eldorado International Airport Tilt-tray sorter (LS-4000E), conveyor 2013 x CZ Prague Airport Tilt-tray sorter 2005 x DE Berlin-Brandenburg Airport 2 tilt-tray sorters	CA	Montréal Airport	CrisBag® tote system with controls	2011		х
CA Toronto Airport BHS with CrisBag®, CrisStore and CrisBelt®, including upper and lower-level controls CA Toronto Airport CrisBag® tote system with controls CA Vancouver Airport 3 tilt-tray sorters (north, south and link) CA Geneva International Airport Tilt-tray sortation system with controls CB Beijing Airport, T3 4 tilt-tray sortation system with controls CB Beijing Capital International Airport Tilt-tray sortation system with controls CB Beijing Capital International Airport Tilt-tray sortation system with controls CB C	CA	Montréal Airport, Transborder	autover®, hot standby control system, BeOS	2009	x	
including upper and lower-level controls CA Toronto Airport CrisBag® tote system with controls 2020 x CA Vancouver Airport 3 tilt-tray sorters (north, south and link) 2007 x CH Geneva International Airport Tilt-tray sortation system with controls 1994 x CN Beijing Airport, T3 4 tilt-tray sorters (upper and lower, east and west) CN Beijing Capital International Airport T2 CN Changsha Airport BHS (LS-4000E) including controls 2000 x CN Guangzhou New Baiyun Airport BHS with tilt-tray sorter conveyor integration and controls (SAC) for out-/inbound / transfer CN Nanjing Airport BHS (LS-4000E) including controls 2014 x CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls (SAC) CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 1999 x CN XiAn Xianguang Airport T3A Tilt-tray sorter (LS-4000E), conveyor (CrisBelt) and entire controls (SAC) CZ Prague Airport Tilt-tray sorter 2 2005 x DE Berlin-Brandenburg Airport 2 tilt-tray sorters 2009 x	CA	Ottawa Airport	CrisBag® tote system with controls	2015		X
CA Vancouver Airport 3 tilt-tray sorters (north, south and link) 2007 x CH Geneva International Airport Tilt-tray sortation system with controls 1994 x CN Beijing Airport, T3 4 tilt-tray sorters (upper and lower, east and west) 2007 x CN Beijing Capital International Airport T2 Tilt-tray sortation system with controls 2000 x CN Changsha Airport BHS (LS-4000E) including controls 2011 x CN Guangzhou New Baiyun Airport BHS with tilt-tray sorter conveyor integration and controls (SAC) for out-/inbound / transfer CN Nanjing Airport BHS (LS-4000E) including controls 2014 x CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls 2008 x CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 1999 x CN XiAn Xianguang Airport T3A Tilt-tray sortation system with controls 2012 x CO Bogotá Eldorado International Airport (CrisBelt) and entire controls (SAC) CZ Prague Airport Tilt-tray sorter 2005 x DE Berlin-Brandenburg Airport 2 tilt-tray sorters 2009 x	CA	Toronto Airport		2021		x
CH Geneva International Airport Tilt-tray sortation system with controls 1994 x CN Beijing Airport, T3 4 tilt-tray sorters (upper and lower, east and west) 2007 x CN Beijing Capital International Airport T2 CN Changsha Airport BHS (LS-4000E) including controls 2011 x CN Guangzhou New Baiyun Airport BHS with tilt-tray sorter conveyor integration and controls (SAC) for out-/inbound / transfer CN Nanjing Airport BHS (LS-4000E) including controls 2014 x CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls (SAC) CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 1999 x CN XiAn Xianguang Airport T3A Tilt-tray sortation system with controls 2012 x CO Bogotá Eldorado International Airport (CrisBelt) and entire controls (SAC) CZ Prague Airport Tilt-tray sorter CZ Prague Airport Tilt-tray sorter CI Seltin-Brandenburg Airport 2 tilt-tray sorters 2009 x	CA	Toronto Airport	CrisBag® tote system with controls	2020		х
CN Beijing Airport, T3	CA	Vancouver Airport	3 tilt-tray sorters (north, south and link)	2007	x	
west) CN Beijing Capital International Airport T2 CN Changsha Airport BHS (LS-4000E) including controls CN Guangzhou New Baiyun Airport BHS with tilt-tray sorter conveyor integration and controls (SAC) for out-/inbound / transfer CN Nanjing Airport BHS (LS-4000E) including controls CN Nanjing Airport BHS (LS-4000E) including controls CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls (SAC) CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls CN XiAn Xianguang Airport T3A Tilt-tray sortation system with controls CO Bogotá Eldorado International Airport CZ Prague Airport Tilt-tray sorter Tilt-tray sorter 2005 x DE Berlin-Brandenburg Airport 21tl-tray sorters 2009 x	СН	Geneva International Airport	Tilt-tray sortation system with controls	1994		X
Airport T2 CN Changsha Airport BHS (LS-4000E) including controls 2011 x CN Guangzhou New Baiyun Airport BHS with tilt-tray sorter conveyor integration and controls (SAC) for out-/inbound / transfer CN Nanjing Airport BHS (LS-4000E) including controls 2014 x CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls (SAC) CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 1999 x CN XiAn Xianguang Airport T3A Tilt-tray sortation system with controls 2012 x CO Bogotá Eldorado International Airport T3A Tilt-tray sorter (LS-4000E), conveyor (CrisBelt) and entire controls (SAC) CZ Prague Airport Tilt-tray sorter 2005 x DE Berlin-Brandenburg Airport 2 tilt-tray sorters 2009 x	CN	Beijing Airport, T3		2007	x	
CN Guangzhou New Baiyun Airport BHS with tilt-tray sorter conveyor integration and controls (SAC) for out-/inbound / transfer CN Nanjing Airport BHS (LS-4000E) including controls 2014 x CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls (SAC) CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 1999 x CN XiAn Xianguang Airport T3A Tilt-tray sortation system with controls 2012 x CO Bogotá Eldorado International Airport (CrisBelt) and entire controls (SAC) CZ Prague Airport Tilt-tray sorter DE Berlin-Brandenburg Airport 2 tilt-tray sorters 2009 x	CN		Tilt-tray sortation system with controls	2000	x	
Airport and controls (SAC) for out-/inbound / transfer CN Nanjing Airport BHS (LS-4000E) including controls CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls (SAC) CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls CN XiAn Xianguang Airport T3A Tilt-tray sortation system with controls CO Bogotá Eldorado International Airport CZ Prague Airport Tilt-tray sorter	CN	Changsha Airport	BHS (LS-4000E) including controls	2011	x	
CN Shanghai Pudong Airport, T2 BHS with tilt-tray sorter and entire controls (SAC) CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 1999 x CN XiAn Xianguang Airport T3A Tilt-tray sortation system with controls 2012 x CO Bogotá Eldorado International Airport (CrisBelt) and entire controls (SAC) CZ Prague Airport Tilt-tray sorter DE Berlin-Brandenburg Airport 2 tilt-tray sorters 2008 x Eldorado International CrisBelt) and entire controls (SAC) Airport 2005 x CZ Prague Airport 2 tilt-tray sorter 2009 x	CN			2004		X
CN Shanghai Pudong Airport, T1 Tilt-tray sortation system with controls 1999 x CN XiAn Xianguang Airport T3A Tilt-tray sortation system with controls 2012 x CO Bogotá Eldorado International Airport (CrisBelt) and entire controls (SAC) CZ Prague Airport Tilt-tray sorter DE Berlin-Brandenburg Airport 2 tilt-tray sorters 2009 x	CN	Nanjing Airport	BHS (LS-4000E) including controls	2014	х	
CN XiAn Xianguang Airport T3A Tilt-tray sortation system with controls 2012 x CO Bogotá Eldorado International Airport (CrisBelt) and entire controls (SAC) 2013 x CZ Prague Airport Tilt-tray sorter 2005 x DE Berlin-Brandenburg Airport 2 tilt-tray sorters 2009 x	CN	Shanghai Pudong Airport, T2	·	2008		x
CO Bogotá Eldorado International Airport BHS with tilt-tray sorter (LS-4000E), conveyor (CrisBelt) and entire controls (SAC) CZ Prague Airport Tilt-tray sorter 2005 x DE Berlin-Brandenburg Airport 2 tilt-tray sorters 2009 x	CN	Shanghai Pudong Airport, T1	Tilt-tray sortation system with controls	1999	х	
Airport (CrisBelt) and entire controls (SAC) CZ Prague Airport Tilt-tray sorter 2005 x DE Berlin-Brandenburg Airport 2 tilt-tray sorters 2009 x	CN	XiAn Xianguang Airport T3A	Tilt-tray sortation system with controls	2012	x	
DE Berlin-Brandenburg Airport 2 tilt-tray sorters 2009 x	со	_		2013		X
	CZ	Prague Airport	Tilt-tray sorter	2005	x	
DE Cologne/Bonn Airport Tilt-tray sorter 1998 x	DE	Berlin-Brandenburg Airport	2 tilt-tray sorters	2009	x	
	DE	Cologne/Bonn Airport	Tilt-tray sorter	1998	x	

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Country	Airport	Supply	Completed	Subcontractor	Main contractor (BHS)
DE	Düsseldorf International Airport, Terminal C	BHS conveyor (CrisBelt) and tote system (CrisBag®) with entire controls (SAC)	2018		x
DE	Düsseldorf International Airport, Terminal B	BHS conveyor (CrisBelt) and tote system (CrisBag®) with entire controls (SAC)	2015		x
DE	Düsseldorf International Airport	2x2 tilt-tray sorters (upper and lower)	2000	х	
DE	Frankfurt Airport	Sortation system (Tilt-Slat) with controls. Note: The system has been decommissioned	1980	х	
DE	Hamburg Airport	Tilt-tray sorter	2003	х	
DE	Hamburg Airport	Tilt-tray sorter	1993	х	
DE	Munich Airport, T2	CrisBag® tote system for outbound, inbound, transfer and interconnection between terminals. Extension of CrisBag® tote system	2003	x	
DE	Munich Airport, T1	Tilt-tray sortation system with controls for outbound Sorters demolished in 2017 and replaced with new sorters	1991 2016	x	x
DE	Munich Airport	BHS (tilt-tray) for transfer baggage. Note: The system has been de-commissioned and replaced by new BHS for Terminal 2	1999		x
DE	Münster/Osnabrück Airport	autover®, check-in, hot standby controls system, BeOS, SAC	2001		x
DE	Stuttgart Airport	Tilt-tray sorter	2003	х	
DK	Billund Airport	BHS system (arrival system)	2020		х
DK	Copenhagen CPH Airport T2	BHS (tilt-tray) for outbound baggage	2005		х
DK	Copenhagen CPH Airport T3	BHS (tilt-tray) for outbound and transfer	1998		х
DK	Copenhagen CPH Airport T1	BHS (tilt-tray) with associated controls for outbound Note: The system has been de-commissioned	1989		x
DK	Copenhagen CPH Airports	BHS (tilt-tray) with controls for transfer. Note: The system has been de-commissioned	1987		X
DK	Aalborg Airport	BHS system (conveyors)	2010		х

				R	ole
Country	Airport	Supply	Completed	Subcontractor	Main contractor (BHS)
EG	Cairo Airport, T3	Tilt-tray sortation system with controls	2024	X	
ES	Barcelona BCN Airport	Tilt-tray sortation system with controls for bags in totes	2008	X	
ES	Fuerteventura Airport	Complete BHS with tote system (CrisBag®), conveyors and controls (SAC)	2011		X
ES	Madrid Barajas Airport T4	Tilt-tray sortation system (\$3000) for outbound; Check-in system with automatic tote feeding; Empty tote return system	2006	x	
ES	Madrid Barajas Airport T123	Tilt-tray sortation system with controls	2001	X	
ET	Addis Ababa Airport	Tilt-tray sortation system (LS-4000E) with EASY control system.	2019	X	
FI	Helsinki Vantaa Airport	BHS with sorter (LS-4000E), tote system (CrisBag®), EBS, connection from check-in, controls (SAC, ECAC3) with expansions.	2011- 2019		x
FR	Nice Airport, Terminal 2	BHS with autover®	2015	х	
FR	Paris Charles de Gaulle Airport, TBS3	BHS for departure bags from Terminal 2E to the Satellite S3	2018		X
FR	Paris Charles de Gaulle Airport, Terminal 1	Tilt-tray sortation system with controls. Phased commissioning.	2005 - 2008	x	
FR	Paris Charles de Gaulle Airport, T2 E&F	Tilt-tray sortation system with controls	2006	x	
FR	Paris Charles de Gaulle, TBF (transfer system)	Tilt-tray sortation system with controls	2000	X	
FR	Paris Charles de Gaulle Airport, T2M	Tilt-tray sortation system with controls for bags in totes.	1993	x	
FR	Toulouse Airport	autover®, hot standby controls system, BeOS	2010		х
НК	Hong Kong Chep Lap Kok International Airport	Tilt-tray sortation system with controls Secondary sorters substantially upgraded in 2007-2010	1998 2010	x	
НК	Hong Kong Kai Tak Airport	Tilt-tray sortation system with associated controls (System was de-commissioned 1998)	1994	X	

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Country	Airport	Supply	Completed	Subcontractor	Main contractor (BHS)
ID	Bali Airport	Tilt-tray sortation system (LS-4000E) with conveyors (CrisBelt® & CrisCheck) and controls (SAC)	2013		x
IL	Ben Gurion Airport, T1	BHS with tilt-tray sorter for outbound with controls (SAC) Integration of screening machines and manual inspection workplaces using CrisBelt	1996- 2000 2017		x
IL	Ben Gurion Airport, T3	BHS with tilt-tray sorter for outbound with controls (SAC)	2004		х
IL	Timna Airport	Complete CrisBelt BHS integrating screening machines and manual inspection workplaces.	2018		X
IN	Bangalore Airport	Tilt-tray sortation system (LS-4000E) with controls	2022		х
IN	Chennai Airport	Tilt-tray sortation system (LS-4000E) with controls	2022	Х	
IN	Calcutta Airport	Tilt-tray sortation system (LS-4000E) with controls	2012	x	
IN	Cochin Airport	Conveyor system	2019		х
IN	Hyderabad International Airport, Departure Terminal	Tilt-tray sortation system (LS-4000E) with controls	2018		х
IN	Hyderabad International Airport, Arrival Terminal	Conveyor system with carousels, S-lifts, SCADA and LLC	2016		х
IN	Mumbai Airport	Tilt-tray sortation system (LS-4000E) with controls	2012	х	
IS	Leifur Eirrikson International Airport (Keflavik)	Tilt-tray sortation system with controls	2007		х
JO	Queen Alia International Airport, Amman	Tilt-tray sortation system (LS-4000E) with BMC.	2019	х	
JP	Kansai Airport, Osaka	2 tilt-tray sorters	1992	х	
KR	Incheon International Airport (Seoul)	Tilt-tray sortation system with controls	2001	x	
KW	Kuwait Airport	Complete CrisBag system with high- and low- level controls	2022	х	
MA	Oujda Angads Airport	BHS with autover®	2010	х	

				R	ole
Country	Airport	Supply	Completed	Subcontractor	Main contractor (BHS)
MX	Santa Lucia Airport	Tilt-tray sortation system with controls	2022	X	
MX	Cancún Airport, T4	Tilt-tray sortation system with controls	2017		x
МХ	Mexico International Airport, T2	CrisBelt solution with new controls system incl. low-level controls, CSC, SAC and SCADA.	2015		x
МХ	Cancún Airport, T3	Tilt-tray sortation system with controls (SAC) Tilt-tray sortation system with controls for HBS	2010		x
			2015		X
MY	Kuala Lumpur Airport KLIA T2	Tilt-tray sortation system	2012	X	
NL	Amsterdam Schiphol Airport	Tilt-tray sortation system with controls	2003	X	
NO	Gardermoen Airport, T1	BHS with CrisBag®, SBD, CrisStore® and CrisBelt®, including upper and lower-level controls	2025		x
NO	Bergen Flesland Airport	CrisBag®, CrisBelt® and CrisStore®	2017	x	
NZ	Auckland Int'l Airport	CrisBag®, CrisStore®, conveyors, and controls	2029		х
PH	Manila Ninoy Aquino International Airport	BHS with tilt-tray sorter and controls (SAC)	2002		x
PL	Gdansk Lech Walesa Airport	BHS with autover [®] , BeOS, SAC and 5-year service contract (upgrade 2018).	2012 2018	x x	
PL	Poznan Lawica Airport	Sorter system (LS-4000econ) with controls (SAC)	2013	X	
PT	Lisbon Airport	Tilt-tray sorter	2007	х	
PT	Porto Airport	Tilt-tray sorter	2002	х	
QA	Hamad International Airport, RTBF	CrisBag®, CrisBelt® and CrisStore®	2022		x
QA	Hamad International Airport (New Doha Int'l Airport)	BHS with tilt-tray, conveyor and controls (SAC) Expansion/ECAC standard 3 upgrade	2012		x
			2022		x
QA	Doha New International Airport	Conveyor BHS (CrisBelt) for airline baggage	2011		x
QA	Doha International Airport	Refurbishment of departure BHS	2011		x
QA	Doha International Airport	Conveyor BHS for transfer bags	2011		x
RU	Sheremetyevo Airport, Terminal C1	autover® system upgrade in 2020	2019 2020		x x

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Country	Airport	Supply	Completed	Subcontractor	Main contractor (BHS)
RU	Sheremetyevo Airport, Terminal B	Tilt-tray sortation system (LS-4000E) with controls	2017	X	
RU	Sheremetyevo Airport, tunnel	autover® system upgrade in 2019	2017 2019	x	X
RU	Sheremetyevo Airport	Tilt-tray sorter	2007	x	
RU	Vnukovo Airport	Tilt-tray sorter	2007	х	
RU	Domodedovo Airport	2 tilt-tray sorters (left and right)	2006	x	
SE	Stockholm Arlanda Airport, Terminal 5 (north)	BHS (tilt-tray) combined with CrisBag® tote system for EBS.			x
		2003 – North system.	2003		
		2005 – Terminal 5 system	2005		
		2011 – Customs and Speed loading in T5 2013 – CB EBS CMC, CrisBag® CSC, CrisBag® elements	2011 2013		
		2014 – T5B Sorter expansion and re-control	2014		
		2017 – CB SAC upgrade	2017		
		2017 – New T5 EBS	2017		
SG	Singapore Changi Airport, T4	BHS with tote system (CrisBag®), check-ins, CrisBelt, carousels, EBS, HLC and LLC	2016		X
SG	Singapore Changi Airport, T3	BHS with tilt-tray sorters, tote system (CrisBag®), EBS, connection to existing terminals and entire controls (SAC)	2006		x
SG	Singapore Changi Airport, T2	2000 – Complete renewal of BHS with tilt-tray sorter and entire controls (SAC)	2000		X
		2004 – Implementation of in-line HBS	2004		Х
		2019 – Complete BHS including conveyors, refurbished tilt-tray sorter, CrisStore EBS and new Control System	2023		X
TH	Bangkok New International	2005 – tilt-tray sortation system with controls	2005	х	
	Airport (BKK)	2013 – tilt-tray sortation system with controls in transfer terminal	2013		
TR	Ankara Airport	Tilt-tray sorter type BS 55 M	2006	x	
TR	Antalya Airport	Tilt-tray sorter	2004	x	
TR	Antalya Airport	Tilt-tray sorter	1998	x	

				R	ole
Country	Airport	Supply	Completed	Subcontractor	Main contractor (BHS)
TR	Antalya Airport	Tilt-tray sorter	1998	х	
TR	Istanbul Atatürk Airport, T2	Tilt-tray sortation system with controls	2000	х	
TR	Izmir Airport	Tilt-tray sorter	2006	х	
TW	Taipei Airport, T1	CrisBag with CrisStore and CSC controls	2019	х	
TW	Taipei Airport, T3	Tilt-tray sortation system with LLC	2023	х	
TW	Taipei CKS Airport, T2	Tilt-tray sortation system with controls	2001	х	
TW	Taipei Airport, T2	Tilt-tray sortation system with controls and CrisStore	2018	х	
UK	London Gatwick Airport, South Terminal	Complete BHS with Tilt-Tray, CrisBelt [®] , CrisBag EBS, and make-up positions.	2016		x
UK	London Heathrow Airport, T4	Tilt-tray sortation system with controls and upgrade to HBS Standard 3	2018	х	
UK	London Heathrow Airport, T2	Upgrade to HBS Standard 3	2017	х	
UK	London Heathrow Airport, T1	Tilt-tray sortation system for outbound and transfer completed 1997.	1997	х	
		Substantial extension and upgrade 2003	2003	X	
		CSC and SAC replaced in 2012	2012	X	
		Upgrade to HBS Standard 3	2017	X	
UK	London Heathrow Airport, T5	Tilt-tray sorter	2002	X	
		2 tilt-tray sorters (inner and outer)	2004	X	
UK	London Stansted Airport	ICS autover® system with controls	2019		X
UK	London Stansted Airport	Tilt-tray sortation system with controls	2003	X	
UK	Manchester Airport, T2	Tilt-tray sortation system with controls	1992	X	
UK	Manchester Airport, T1	1983 – Tilt-Slat sortation system	1983	X	
		1996 – The above system was replaced by a tilt- tray sortation system. Note: The system has been decommissioned.	1996		
US	Atlanta Hartfield International Airport	Tilt-tray sortation system with controls for outbound	1994	х	
US	Cincinnati / Northern Kentucky International Airport	CrisBag [®] 6.3 with full HLC	2026 /2029		X
US	Cincinnati / Northern Kentucky International Airport	Tilt-tray sortation system with controls	1994	х	

				R	ole
Country	Airport	Supply	Completed	Subcontractor	Main contractor (BHS)
US	Denver Airport	Complete autover® system	2022	X	
US	Gerald Ford Int'l Airport (Grand Rapids)	CrisBag® 6.3 with full HLC	2027		x
US	Houston George Bush International Airport	Tilt-tray sortation system for outbound with controls	2004	х	
US	JFK Airport, New York	Tilt-tray sorter	1999	х	
US	Newark International Airport, T3	Tilt-tray sortation system with controls	2001	х	
US	San Francisco Airport, Int'l	Conveyor system	2020		х
US	San Francisco Airport, T1	Design and build of complete BHS using CrisBag technology.	2020		x
US	San Francisco Airport, IBAB	Interim CrisBag® and conveyor system for inbound and outbound with controls	2016		x
US	Washington Dulles International Airport	Tilt-tray sortation system with controls	2004	х	
US	Washington Dulles International Airport	Tilt-tray sortation system with associated controls	1996	х	
VN	Cam Ranh Airport	CrisBelt system with check-ins and carousels	2018	X	
VN	Da Nang Airport	CrisBelt system with CrisCheck and carousels	2017	X	
VN	Hanoi, Noi Bai International Airport T1	2002 – Complete BHS with tilt-tray sorter and controls (SAC)	2002		X
		2007 – Upgrade and extension of above BHS	2007		
VN	Ho Chi Minh, Tan Son Nhat Airport	Tilt-tray sortation system with controls	2006	х	
ZA	Johannesburg O.R. Tambo International Airport	New BHS including tilt-tray sorters, upper-level controls (SAC) and integration of HBS in the Central Terminal Building.	2010		x
ZA	Johannesburg O.R. Tambo International Airport, Domestic Terminal B	Complete BHS including conveyors, tilt-tray sorter and controls (SAC). The low control system was upgraded in 2011.	2001		x
ZA	Johannesburg O.R. Tambo International Airport	Extension of the tilt-tray sorter in International Terminal A.	1998		x
ZA	Johannesburg O.R. Tambo International Airport	Installation of International Terminal A: Tilt-tray sorter and controls.	1994		X

四、 BEUMER Group 公司 丹麥廠廠驗

本次廠驗會同本案監造單位及承攬廠商廣運機械股份有限公司相關人員出席,BEUMER Group公司由Elkjær, Christian Kjer專案經理(Project Manager)帶隊會同,內容概述如下:

表 4 廠驗內容

項次	內容
*\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	BEUMER Group公司由Elkjær, Christian Kjer專案經理(Project
説明會議 	Manager)針對本次,介紹團隊成員、公司成長歷程、展望及相關產品介紹,與本次廠驗設備項目、流程及查驗內容。
安全宣導	介紹公司園區內各建築物相關地理位置,及宣導進出各工作環境之危害
女王旦等	因素,及安全衛生注意事項。
系統功能測試	設備已架設於工廠進行現場測試,在BEUMER Group現場操作人員實際運
説明及査驗	作下,本案所採用之設備尺寸、外觀、運行、停止、緊急停機、行李排放
1元9万/又旦 南秋	及指定路線等功能進行查驗。
原廠設備組裝	由原廠工程師介紹及導覽產線及生產,進行組裝展示,這可使人員能夠看
展示	到特定設備的組裝過程。



圖 5 設備測試前說明(1)



圖 6 設備測試前說明(2)



圖7設備測試前說明(3)



圖 8 進入工廠相關注意說明

(一) 高速小車(ICS)行李處理系統廠驗過程

本案採用BEUMER Group的高速小車系統(型號:CrisBag®)及貨架式早到行李儲存系統 (Early Baggage System, EBS),設備已架設於工廠進行現場測試,在BEUMER Group現場操作人員實際運作下,本案所採用之設備尺寸、外觀、運行、停止、緊急停機、行李排放及指定路線等功能皆正常。



圖 9 高速小車 ICS 系統功能測試說明



圖 10 高速小車 ICS 系統功能測試(1)



圖 11 高速小車 ICS 系統功能測試(2)



圖 12 高速小車 ICS 系統功能測試(3)

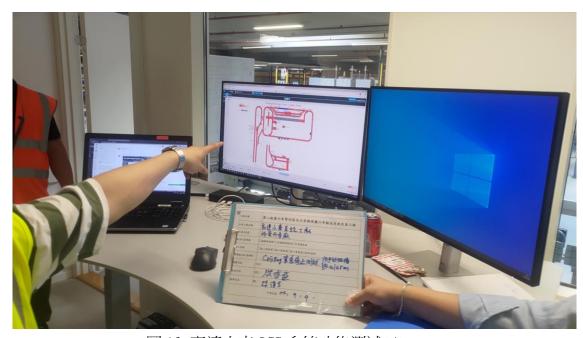


圖 13 高速小車 ICS 系統功能測試(4)

表 1 分流設備靜態檢查表

Table 1 Diverter Equipment Static Inspection Checklist

編號 Number:

					.納 派 Number ·			
工程名稱 Project Name		第二航廈行李暫存區及北登機廊廳行李輸送系統改善工程						
		Improvement Project of Baggage Conveying System Baggage Temporary Storage Area						
		and North C	Concourse in Termin	al 2				
分項工程名稱 分		分流設備 2	600R	協力廠商	左山上			
Sub-Proje	ct Name	Diverter Equ	uipment 2600R	Co-Contracto	r 2100			
檢測	位置	22月15	沙市	檢查日期	r 全的名 te 114.09.08	1		
Inspection	Location	柏曼丹多廠		Inspection Dat	te 114.01.00			
檢測	時機	廠驗						
Inspectio	n Timing	Factory Acc	eptance					
檢驗: Inspectio		0檢測合格(Qualified /有缺失需	;改正 Defect to c	correct /無此檢測項目 N	lo such item		
			14 m 1195 34 / Ja	n a a u \	實際檢測情形 (敘述檢測值)	檢測結果		
	檢測項目		檢測標準(定		Actual Inspection Status	Inspection		
In	spection It	tem	Inspection S	Standard	(Describe the Inspection Value)	Result		
顏色	機身顏色				sable out boot	b合格 Pass		
Color	Machine		RAL 5005		tt計社 RALSOUS	□不合格 Fail		
COIOI	Macrime Color				180			
	機身長度 Machine Length		2590mm±10 mm		2587 mm	哈格 Pass		
						□不合格 Fail		
尺寸	機身高度 Machine Height		395.9mm±10 mm		395.0 mm	合格 Pass		
Dimension					317	□不合格 Fail		
	機身寬度 Machine Width		1000mm±10 mm			合格 Pass		
					1000 mm	□不合格 Fail		
40					Alan Steel in the To			
一般	設備狀況		目視(設備外觀無損		外观·研拔傷且整環			
General	Equipmer	nt Status	Visual (No apparent da	amage and clean)		□不合格 Fail		
缺失複查統	结果Defec	t review resu	ult:					
		改善前中後						
			efore, during, and a		ent)			
			追蹤表」進行追路 n the "Defect impro		g form" for tracking			
Untinish 複查日期		100	n the "Defect Impro 日	vernent tracking	5 IOITH TOI CLACKING			
後亘ロ朔 Review dat		/1	-					
複查人員」				簽名	3:			
	rsonnel tit	le:		Sign	nature:			

圖 14 高速小車 ICS 系統功能測試紀錄

備註Remarks:

1.檢查標準及實際檢查情形應具體明確 (例:磚砌完成後須不透光)或量化尺寸 (例:磚縫 7mm~10mm) •

Inspection standards and actual inspection results shall be specific and clear (e.g., after bricklaying, the wall must be opaque) or quantified in dimension (e.g., brick joints 7mm~10mm).

2.檢查結果合格者註明「O」,不合格者註明「X」,如無需檢查之項目則打「/」。 For inspection results, mark "O" for pass, "X" for fail, and "/" for items not requiring inspection.

3.嚴重缺失、缺失複查未能及時完成改善,應填具「不合格報告及改善通知單」進行追蹤改善,本表 單可先行存檔。

For serious deficiencies or deficiencies not corrected in time upon re-inspection, a "Non-Conformance Report and Corrective Action Notice" shall be issued for tracking and improvement. This form may be filed

4.本表由工地現場工程師或領班實地檢查後覈實記載簽認。

This form shall be verified, recorded, and signed by the site engineer or foreman after an on-site inspection.

會測人員簽名:

現場人員簽名(檢查人員):

Test Participant Signature:

CTCI 次有型 spor

Site Personnel Signature (Inspection Personnel):

KENMEC: 林寶子 ·9-9

BEUMER: Jeffrey Roon 0909

直行設備靜態檢查表 表 2

Table 2 Straight Conveyor Equipment Static Inspection Checklist

編號:

					新 统 ·			
工程名稱 Project Name		第二航廈	夏行李暫存區及北登機	美廊廳行李輸 並	总系統改善工程			
		Improvement Project of Baggage Conveying System Baggage Temporary Storage						
		Area and	North Concourse in Te	erminal 2				
分項工程名稱 .		直行設備	土 月	協力廠商	4.14.			
Sub-Proje	ect Name	Straight (Conveyor Equipment	Co-Contracto	金的合			
檢測	The second second	柏	曼丹麥廠	檢查日期	114.09.08			
Inspection	10.10.0		217"	Inspection Da	te			
檢測	時機	廠驗						
Inspectio	n Timing	Factory A	Acceptance					
檢驗 Inspection		O檢測合	格 Qualified /有缺失需	改正 Defect to	correct /無此檢測項目	No such item		
检測項目 Inspection Item		m	檢測標準(定量定性) Inspection Standard		實際檢測情形(敘述檢測值) Actual Inspection Status (Describe the Inspection Value)	檢測結果 Inspection Result		
顏色 Color	機身顏色 Machine Color		RAL 5005		t対色卡RAL5005 存名	d名格 Pass □不合格 Fai		
	機身長度 Machine Length		959mm±10 mm		965 mm	6合格 Pass □不合格 Fai		
尺寸 Dimension	機身高度 Machine Height		395mm±10 mm		394 mm	□不合格 Fai		
	機身寬度 Machine Width		2000mm±10 mm		1994 mm	L合格 Pass □不合格 Fa		
一般 General			目視(設備外觀無損傷且整潔) Visual (No apparent damage and clean)		外观研报停且整震	□合格 Pass □不合格 Fa		
LL 4 15 ± 1	上田口	manufarra de	cult :					
缺失複查絲 □已完成改	善(檢附	改善前中	後照片)					
□未完成改	善,填具	「缺失改	before, during, and af 善追蹤表」進行追蹤	改善				
			in the "Defect improv	ement tracking	torm" for tracking			
複查日期		月	日					
Review dat				簽名				
複查人員用	咸神·			双七	, .			

Signature:

Review personnel title:

備註Remarks:

1. 檢查標準及實際檢查情形應具體明確 (例:磚砌完成後須不透光)或量化尺寸 (例:磚縫7mm~10mm)。

Inspection standards and actual inspection results shall be specific and clear (e.g., after bricklaying, the wall must be opaque) or quantified in dimension (e.g., brick joints 7mm~10mm).

2.檢查結果合格者註明「O」,不合格者註明「╳」,如無需檢查之項目則打「╱」。
For inspection results, mark "○" for pass, "╳" for fail, and "╱" for items not requiring inspection.

3.嚴重缺失、缺失複查未能及時完成改善,應填具「不合格報告及改善通知單」進行追蹤改善,本表單可先行存檔。

For serious deficiencies or deficiencies not corrected in time upon re-inspection, a "Non-Conformance Report and Corrective Action Notice" shall be issued for tracking and improvement. This form may be filed in advance.

4.本表由工地現場工程師或領班實地檢查後覈實記載簽認。

This form shall be verified, recorded, and signed by the site engineer or foreman after an on-site inspection.

會測人員簽名:

Test Participant Signature:

CT-CZ)治市型 opop

TIAC 多字氏 1100

現場人員簽名(檢查人員):

Site Personnel Signature (Inspection Personnel):

KENMEC: 甘蓝年 0909

BELIMER: Jeffrey Pan 1999

表 3 托盤靜態檢查表

Table 3 Tub Static Inspection Checklist

編號 Number:

						1374 376			
工程名稱		第二航廈	行李暫存區及北登楼	と 感 癒 行 李 輸 さ	送系約	充改善工程			
		Improvement Project of Baggage Conveying System Baggage Temporary Storage							
Project	Project Name		Area and North Concourse in Terminal 2						
分項工	程名稱	托盤		協力廠商		AILL			
Sub-Proje	ect Name	Tub		Co-Contractor		金怡后			
檢測	位置	L. B.	2 1 5	檢查日期		114. 09.08			
Inspection	Location	和多十	柏曼丹麥殿		ate				
	時機	廠驗							
Inspection	n Timing	Factory Ac	cceptance						
	結果	İ	- 100 1 1 / 1-11 1 3			- / - U IA WIFE P	No such itom		
Inspection	on Result	O檢測合格	Qualified ×有缺失需	的企 Defect to	corre	Ct / 無此檢測項目	No such item		
•			14 m115 /t / da	日本以入	實際核	 食測情形(敘述檢測值)	檢測結果		
	檢測項目		檢測標準(定量定性)		Ac	tual Inspection Status	Inspection		
In	spection Ite	em	Inspection St	andard	(Desci	ribe the Inspection Value)	Result		
	托盤長度 Tub Length		1150mm±10 mm		1140mm		恰格 Pass		
							□不合格 Fai		
- 1	托盤高度 Tub Height 托盤寬度 Tub Width		200mm±10 mm		196 mm		冷格 Pass		
尺寸									
Dimension							□不合格 Fai		
			900mm±10 mm		8 11 mm		b合格 Pass		
							□不合格 Fai		
一般	設備狀況		目視(設備外觀無損傷且整潔)		外观研查自整课		合格 Pass		
General	Equipmen	t Status	Visual (No apparent damage and clean)				□不合格 Fai		
独失複杏丝	古果 Defect	review resi	ult:						
		改善前中後							
			pefore, during, and af		ent)				
			美追蹤表」 進行追蹤			W.C			
			n the "Defect improv	ement tracking	g torn	n" for tracking			
複查日期 Review dat		月	日						
Review dat 複查人員I				簽名	名:				
汉旦八只,	m/1111 .			~~~					

Review personnel title:

Signature:

備註Remarks:

1.檢查標準及實際檢查情形應具體明確(例:磚砌完成後須不透光)或量化尺寸(例:磚縫7mm~10mm)。

Inspection standards and actual inspection results shall be specific and clear (e.g., after bricklaying, the wall must be opaque) or quantified in dimension (e.g., brick joints 7mm~10mm).

2.檢查結果合格者註明「O」,不合格者註明「╳」,如無需檢查之項目則打「╱」。
For inspection results, mark "○" for pass, "╳" for fail, and "╱" for items not requiring inspection.

3.嚴重缺失、缺失複查未能及時完成改善,應填具「不合格報告及改善通知單」進行追蹤改善,本表單可先行存檔。

For serious deficiencies or deficiencies not corrected in time upon re-inspection, a "Non-Conformance Report and Corrective Action Notice" shall be issued for tracking and improvement. This form may be filed in advance.

4.本表由工地現場工程師或領班實地檢查後覈實記載簽認。

This form shall be verified, recorded, and signed by the site engineer or foreman after an on-site inspection.

會測人員簽名:

現場人員簽名(檢查人員):

Test Participant Signature:

Site Personnel Signature (Inspection Personnel):

Ct-Cl 3/2 # 2010P

KENMEC: #129 -9.9

TIAC 養守品門門

BEUMER: Jeffrey Pan 0909 1045

CrisBag 基本功能測試檢查表 表 4

Table 4 CrisBag Basic Function Test Checklist

編號 Number:

				編號 Number:			
T 19 9 19	第二航廈行	第二航廈行李暫存區及北登機廊廳行李輸送系統改善工程					
工程名稱	Improvement Project of Baggage Conveying System Baggage Temporary Storage Area and						
Project Name	North Concourse in Terminal 2						
分項工程名稱	動態測試-	測試迴路	協力廠商	4.46			
Sub-Project Name	Dynamic Te	est – Test Circuit Co-Contractor		金怡台			
檢測位置	相曼丹	上之前	檢查日期	114.09.09			
Inspection Location	州支工	了多风	Inspection Date	114.01.01			
檢測時機	廠驗						
Inspection Timing	Factory Ins	pection					
檢驗結果	0 协测人故	Qualified V去幼生素	24 I Defect to cor	rect /無此檢測項目 No suc	hitom		
Inspection Result	O做例合格	Qualified 人有缺大高	及止 Defect to con	Tect / 無此傚例項目 No suc	ii iteiii		
檢測項目		檢測標準()	字号字(4)	實際檢測情形(敘述檢測值)	檢測結果		
Inspection It	om			Actual Inspection Status	Inspection		
mspection it	em	Inspection Standard		(Describe the Inspection Value)	Result		
啟動 CrisBag® 系統		系統啟動與初始化		的新正常	b合格 Pass		
Start CrisBag® system	n	System startup and	initialization	啟動正常	□不合格 Fail		
行李從輸送帶傳送到頂部裝載機 Baggage transferred from conveyor to top loader		傳送無誤		停送正常	合格 Pass □不合格 Fail		
行李裝入托盤。		自動裝載		白玉松林工冶	b合格 Pass		
Baggage loaded into	tub	Automatic loading		自動裝載正常	□不合格 Fail		
托盤朝卸載方向移動 Tub moves toward direction		運行無誤 Operation successful		運行正常	L合格 Pass □不合格 Fail		
卸載行李		行李自動卸載無誤		行李自劲卸载	冷格 Pass		
Unload baggage		Automatic baggage u			□不合格 Fail		
□未完成改善,填具	改善前中征 otographs 「缺失改善	後照片) before, during, and a ∮追蹤表」進行追蹤	改善				
Unfinished improv 複查日期: 年	rement, fill i 月	n the "Defect improv 日	ement tracking f	orm" for tracking			

Review date:

複查人員職稱:

簽名:

Review personnel title:

Signature:

備註Remarks:

- 1.檢查標準及實際檢查情形應具體明確 (例:磚砌完成後須不透光) 或量化尺寸 (例:磚縫7mm~10mm)。 Inspection standards and actual inspection results shall be specific and clear (e.g., after bricklaying, the wall must be opaque) or quantified in dimension (e.g., brick joints 7mm~10mm).
- 2.檢查結果合格者註明「o」,不合格者註明「╳」,如無需檢查之項目則打「╱」。
 For inspection results, mark "○" for pass, "╳" for fail, and "╱" for items not requiring inspection.
- 嚴重缺失、缺失複查未能及時完成改善,應填具「不合格報告及改善通知單」進行追蹤改善,本表單可 先行存檔。

For serious deficiencies or deficiencies not corrected in time upon re-inspection, a "Non-Conformance Report and Corrective Action Notice" shall be issued for tracking and improvement. This form may be filed in advance.

4.本表由工地現場工程師或領班實地檢查後覈實記載簽認。

This form shall be verified, recorded, and signed by the site engineer or foreman after an on-site inspection.

會測人員簽名:

現場人員簽名(檢查人員):

Test Participant Signature:

CT (1)K \$ 2 of of

Site Personnel Signature (Inspection Personnel):

KENMEC = # 129 09.9

TIAC 黃宇的奶

BRUMER : Jeffrey Poon 1049

表 5 CrisStore 基本功能測試檢查表

Table 5 CrisStore Basic Function Test Checklist

編號 Number:

				National State of the Control of the		
工程名稱	第二航廈	[行李暫存區及北登機	廊廳行李輸送系	統改善工程		
Project Name	Improver	ent Project of Baggage Conveying System Baggage Temporary Storage Area and				
Project Name	North Co	ncourse in Terminal 2				
分項工程名稱	動態測試-測試迴路		協力廠商	金怡右		
Sub-Project Name	Dynamic Test – Test Circuit		Co-Contractor	クロロロ		
檢測位置	十万易	丹孝廠	檢查日期	114.09.09		
Inspection Location	十日文	丁万风	Inspection Date	114.01.01		
檢測時機	廠驗					
Inspection Timing	Factory Inspection					
檢驗結果	0拾測点数	文 Qualified V 右独生電	24 F Defect to con	rrect /無此檢測項目 No	such item	
Inspection Result	0 饭 炽 合 个	A Qualified 人有缺大高	及正 belect to col	Tect / 無此傚例項目 NO:	suchitem	
檢測項目		檢測標準(定	昌宁州)	實際檢測情形 (敘述檢測值)	檢測結果	
		100000000000000000000000000000000000000		Actual Inspection Status	Inspection	
Inspection Ite	em	Inspection Standard		(Describe the Inspection Value)	Result	
the fit Cris Dan Sa Cris Chang 2 ht		3 4+ 66 fee to 2 - 14 11.		1171-4	合格 Pass	
啟動 CrisBag 和 CrisStore 系統		系統啟動與初始化 System startup and initialization		啟動時		
Start CrisBag and CrisStore systems				,	□不合格 Fail	
行李從輸送帶傳送到頂部裝載機		傳送無誤 Transfer successful		停运正常	论合格 Pass	
Baggage transferred from conveyor						
to top loader		Hansier succession			□不合格 Fail	
行李裝入托盤。		自動裝載		自動裝載正常	i合格 Pass	
Baggage loaded into tub		Automatic loading		34 2011	□不合格 Fail	
Le an to Coi-Ct 19	£, ¥ ;4					
托盤朝 CrisStore 移動並進		電行血铝		運行正常	合格 Pass	
↑ CrisStore		運行無誤 Operation successful		AIJE		
Tub moves toward CrisStore and enters CrisStore		Operation successful			□不合格 Fail	
	本的红船	裝有行李的托盤自動存在	y	- BP (71 LV		
小型裝載機拾取裝有行李的托盤 並放入儲存貨架		Empty tub retrieved from CrisStore and		托盤的存效	t A Pass	
並放入網行貝米 Shuttle picks up tub with baggage		automatically enters the CrisBag system		正常		
and places it onto the storage rack		without error		1	□不合格 Fail	
•		從 CrisStore 拾取空的托	般並自動准入	64 021/4 4 th-An		
小型裝載機從儲存貨架中拾取空 的托盤並進入 CrisBag 系統		CrisBag 系統無錯誤		從Cristole拾取	. /	
Shuttle retrieves an empty tub from				空托盤並自動	合格 Pass	
the storage rack and transfers it		automatically transferred into the CrisBag		近入CtisBag等强	□不合格 Fail	
into the CrisBag system		system without error.		正常		
the chibbag system		System Mandat Ciron.				

缺失複查結果Defect review result:

□已完成改善(檢附改善前中後照片)

Improved (with photographs before, during, and after improvement)

□未完成改善,填具「缺失改善追蹤表」進行追蹤改善

Unfinished improvement, fill in the "Defect improvement tracking form" for tracking

複查日期:

年 月 E

Review date:

複查人員職稱:

簽名:

Review personnel title:

Signature:

備註Remarks:

- 1.檢查標準及實際檢查情形應具體明確(例:磚砌完成後須不透光)或量化尺寸(例:磚縫7mm~10mm)。 Inspection standards and actual inspection results shall be specific and clear (e.g., after bricklaying, the wall must be opaque) or quantified in dimension (e.g., brick joints 7mm~10mm).
- 2.檢查結果合格者註明「O」,不合格者註明「╳」,如無需檢查之項目則打「╱」。
 For inspection results, mark "○" for pass, "╳" for fail, and "╱" for items not requiring inspection.
- 嚴重缺失、缺失複查未能及時完成改善,應填具「不合格報告及改善通知單」進行追蹤改善,本表單可 先行存檔。

For serious deficiencies or deficiencies not corrected in time upon re-inspection, a "Non-Conformance Report and Corrective Action Notice" shall be issued for tracking and improvement. This form may be filed in advance.

4.本表由工地現場工程師或領班實地檢查後覈實記載簽認。

This form shall be verified, recorded, and signed by the site engineer or foreman after an on-site inspection.

會測人員簽名:

現場人員簽名(檢查人員):

Test Participant Signature:

Site Personnel Signature (Inspection Personnel):

3发东至0月以

TIAC 養守品 110

BEUMER : Jeffry Poon 1045

KENMEC = # 185 799

表 6 CrisBag 錯誤功能測試檢查表

Table 6 CrisBag Error Function Test Checklist

編號 Number:

工程名稱	parties and the second second	丁李暫存區及北登機				
上柱石树 Project Name	Improvement Project of Baggage Conveying System Baggage Temporary Storage Area and					
Project Name	North Cond	ourse in Terminal 2				
分項工程名稱	動態測試-	則試迴路	協力廠商	金胎合		
Sub-Project Name	Dynamic Test – Test Circuit		Co-Contractor	2101)		
檢測位置	相量中	-2156	檢查日期	114.09.09		
nspection Location	州文	多)一个	Inspection Date	111111111111111111111111111111111111111		
檢測時機	廠驗					
Inspection Timing	Factory Ins	pection				
檢驗結果	0检测会枚	Qualified ×有缺失雲	改正 Defect to cor	rect /無此檢測項目 No sucl	h item	
Inspection Result	O1X /X 13 118	Qualified / / / July / m	72 Bereet to 65.	, M. C. M. J. M. C. M. C		
檢測項目		檢測標準(定量定性) Inspection Standard		實際檢測情形(敘述檢測值)	檢測結果	
Inspection It				Actual Inspection Status	Inspection	
mspection in	lem			(Describe the Inspection Value)	Result	
1. 頂部裝載機 - 丸	超長行李錯	誤測試				
Top Loader – Ove	erlength Bag	gage Error Test				
(1)行李從輸送帶轉移到頂部 裝載機		行李正確轉移 Baggage transferred correctly		行李轉發正確	/	
					合格 Pass	
Baggage transfe	rred from				□不合格 Fai	
conveyor to top	loader					
(2)當行李被轉移至	川頂部裝載	系統收到錯誤警告	-。行李停止並等	条绕收到鍩設信號		
機的第一個輸送帶時,手 動阻擋感應器 When baggage is		待處理人員。錯誤指示燈亮起。 System receives error warning. Baggage stops and waits for operator.				
				行管理行停止並高 or. 起儲設指示灯,	合格 Pass	
				or. 起賭錢指示灯,	□不合格 Fai	
transferred to the first		Error indicator light turns on.		存各核则標準。	山水石福山山	
conveyor of the	top loader,			1804901440		
manually block t	the sensor				-	
(3)移走行李	8走行李 移除			故障排降,移降	恰格 Pass	
Remove baggage		Baggage removed		行委。	□不合格 Fa	
(4) 重置操作面板」	上的警報	錯誤解除		錯誤解除程序	i合格 Pass	
Reset alarm on operation		Error cleared		BURY HINE!		
panel				正常。	□不合格 Fa	
		警報重置,系統恢	灭復正常。下一 個	国 重置後年3分校後		
(5) 重置 CSC 系統	中的警報	行李正確裝入托盤		1 × 10 12 × 1	6合格 Pass	
Reset alarm in C		Alarm reset, system		工中,一個打多上	□不合格 Fai	
		Next baggage correc		74 41 \ P. ME		
2. 直行元件堵塞錯	昔誤測試				•	

Straight Conveyor Componer	nt Jam Error Test		
(1)托盤正確地朝測試元件移動	托盤運行正常	托整移動為同及	合格 Pass
Tub moves correctly toward test component	Tub running normally	.ヨローち	□不合格 Fail
(2)在托盤進入測試元件之	在測試元件和元件進入自我檢查模	子动科物心地动)	
前,手動阻擋測試元件上	式之前,托盤停止	社造於例付元件	
的感應器	Tub stops before entering test	与元件企入自我核	6合格 Pass
Before tub enters test	component and before self-check	查模式前即停止	□不合格 Fail
component, manually block	mode	1 1 1 1 1	
sensor on test component		存后叛则模阵。	
(3) 測試元件自我檢查失敗,	托盤仍然停止,元件停止自我檢查	测试元件直接效	
CSC系統發出警報。	等待操作人員	0	合格 Pass
Test component self-check	Tub remains stopped, component	時,CSC发出警報	
fails, CSC system issues	stops self-check awaiting operator	托整份止,看各核	□不合格 Fail
alarm		侧杯平。	
(4)移除阻擋感應器的物體	托盤和元件仍然停止	移除阻擋物後、托	合格 Pass
Remove object blocking	object blocking sensor	超及元件仍停止,谷	□不合格 Fail
sensor	Tub and component remain stopped	后核则标准。	一个合格「dii
(5)重置 CSC 系統中的警報	警報重置,系統恢復正常。托盤在系	CSC警報重置後,	
Reset alarm in CSC system	統中重新開始。	条流恢复,托整	合格 Pass
	Alarm reset, system returns to normal,	開始到了,移核	□不合格 Fail
	tub restarts in system	侧棋母。	
3. CrisBag® ETV 測試			
CrisBag® ETV Test		** - '	
(1)卸載行李	正確卸載	卸载正確。	合格 Pass
(1) Unload baggage	Baggage unloaded correctly		□不合格 Fai
(2)托盤進入空的托盤線	托盤正確進入空的托盤線	托整近入空托整线	b合格 Pass
Tub enters empty tub line	Tub enters empty tub line correctly	正確。	□不合格 Fai
(3)在托盤通過 ETV 前,手	托盤通過 ETV	以行在取代刊初到	/
動阻擋 ETV	Tub passes ETV	以行家取代于郊阳梅ETV。	格 Pass
Before tub passes ETV,		913 4 100	□不合格 Fai
manually block ETV			
(4)托盤通過 ETV	托盤停在安裝 ETV 的元件上等待人	托盤正確倍於 安裝ZTV之元件上。	/
Tub passes ETV	工處理。	必然ファリンライキト	合格 Pass
	Tub stops on component with ETV,	122 EIV ZNOT-	□不合格 Fai
	waiting for manual handling		
(5)模擬移除行李並在操作面	模擬移除,ETV 錯誤重置。空的托	模擬行李移阵及	
板上重置 ETV 錯誤	盤繼續存放。	ETV錯误重置後,	恰格 Pass
Simulate baggage removal	Simulated removal, ETV error reset,	空托盤继續執行	
and reset ETV error on	empty tub continues storage	左上上20ch	山下市格「di
operation panel		183人村1	

(1) 仁本大色统由黑仁	雷仁血社识	FIZ Y	. / 11 =
(1)行李在系統中運行	運行無錯誤	连行正常	哈格 Pass
Baggage running in system	No errors in operation		□不合格 Fail
(2)觸發緊急停止,模擬緊急	在操作面板上出現警報信號的位置	托盤於按下紧急停	
情况	停止所有托盤	止挖鈕後生面停止	b合格 Pass
Trigger emergency stop,	All tubs stop at alarm signal location	沿后城四村奔。	□不合格 Fail
simulate emergency	on operation panel	43/6/32(27/10)	
(3)托盤停止	所有托盤停止	托强全面停止。	b合格 Pass
Tub stops	All tubs stopped		□不合格 Fail
(4)解除觸發的緊急停止	解除緊急停止	教行军急停止之解	
Release triggered	Emergency stop released		₩合格 Pass
emergency stop		除。	□不合格 Fail
(5)重置面板上與急停相關的	緊急停止警報正確重置	重显紧急停止整報	
警報	Emergency stop alarm correctly reset	正湖。	₩合格 Pass
Reset alarm on panel		Lang o	□不合格 Fai
related to emergency stop			
(6)從 CSC 系統重新啟動系	系統正確重置,所有托盤恢復運作。	学说主题後,門有托	
統	System correctly reset, all tubs resume		
Restart system from CSC	operation	核则标件。	□不合格 Fail
system		AX 12 1 10	
5. 附加錯誤測試	项目:分拨荔枝误测试.	彪座器手动遮蔽	
註:可根據需求在廠驗期間	四时的名:行李托登丰依時间部明分		1-15
執行額外的錯誤測試。	摇器.	後,所托整停上建	る行
Note: Additional error tests	则对对:手劲遮蔽感应器,模擬	1年,看客校四杯邓	
may be executed during FAT if	产额 电台 通知	01. 10	
required	按例标准:FT有托整停止。		
快失複查結果Defect review res	sult:		
C元放以音(微附以音用 中1	支 照 万 丿		
Improved (with photographs 未完成改善,填具「缺失改善。	before, during, and after improvement) 美油燃料、推行油燃料等		
	音追峽衣」進行追峽仪音 in the "Defect improvement tracking forr	m" for tracking	
夏查日期: 年 月	日		
eview date:			

Signature:

Review personnel title:

備註Remarks:

- 1.檢查標準及實際檢查情形應具體明確 (例:磚砌完成後須不透光) 或量化尺寸 (例:磚縫7mm~10mm)。 Inspection standards and actual inspection results shall be specific and clear (e.g., after bricklaying, the wall must be opaque) or quantified in dimension (e.g., brick joints 7mm~10mm).
- 检查結果合格者註明「O」,不合格者註明「╳」,如無需檢查之項目則打「✓」。
 For inspection results, mark "○" for pass, "╳" for fail, and "✓" for items not requiring inspection.
- 嚴重缺失、缺失複查未能及時完成改善,應填具「不合格報告及改善通知單」進行追蹤改善,本表單可 先行存檔。

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This form shall be verified, recorded, and signed by the site engineer or foreman after an on-site inspection.

會測人員簽名:

現場人員簽名(檢查人員):

Test Participant Signature:

CECL TE TO SPOR

Site Personnel Signature (Inspection Personnel):

KENMEC: # 199 9.9

TIAC 专写民

BEUMER: Jeffry Poon 1945

(二) 原廠設備組裝展示

原廠的CrisBag®設備,進行組裝展示,這可使人員能夠看到特定設備的組裝過程。



圖 15 原廠組裝展示過程(1)



圖 16 原廠組裝展示過程(2)



圖 17 原廠組裝展示過程(3)



圖 18 原廠組裝展示過程(4)

五、 實測驗證

(一) 挪威奧斯陸機場

- 1. 機場簡介
 - (1) 挪威第一大機場。
 - (2) 一棟航廈。
 - (3) 旅客量約2.2千萬人次/年。

2. 參訪紀錄

此次參訪之主要標的為BEUMER公司目前正在汰換建置之高速小車ICS系統,該系統主要用於處理奧斯陸機場航廈旅客報到櫃台區之出境行李,故此系統為BEUMER公司最新之高速小車ICS系統,主要設備建置於地下層,據介紹系統人員表示,該機場為營運中之機場,此系統汰換建置需相當長時間,因此該工程從設計施工,以及後續操作維護之相關實務經驗,對於本機場有相當重要之參考價值。

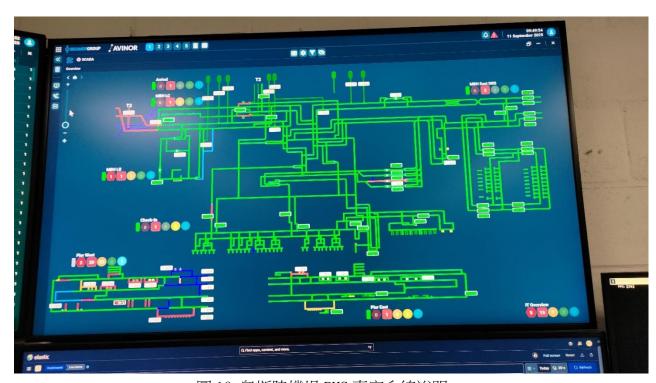


圖 19 奧斯陸機場 BHS 專案系統說明



圖 20 奧斯陸機場 BHS 系統(1)



圖 21 奧斯陸機場 BHS 系統(2)



圖 22 奧斯陸機場 BHS 系統(3)



圖 23 奧斯陸機場 BHS 系統(4)



圖 24 奧斯陸機場 X 光機檢查區

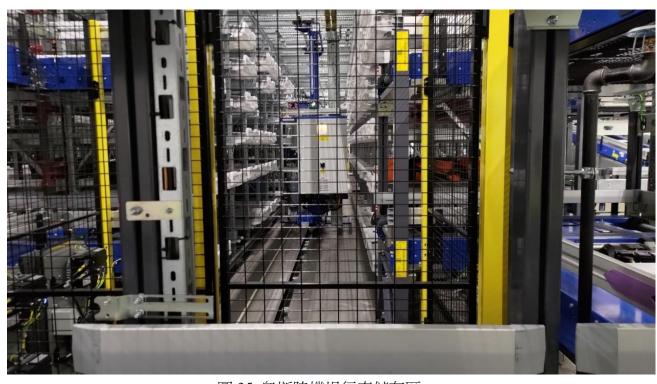


圖 25 奧斯陸機場行李儲存區



圖 26 奧斯陸機場行李搬運省力裝置(1)



圖 27 奧斯陸機場行李搬運省力裝置(2)

(二) 丹麥哥本哈根機場

- 1. 機場簡介
 - (1) 丹麥第一大機場。
 - (2) 三座航廈。
 - (3) 旅客量約3千萬人次/年。

2. 參訪紀錄

此次參訪之主要標的為BEUMER公司建置之高速小車ICS系統,該系統主要用於 處理哥本哈根機場T2及T3航厦旅客報到櫃台區之出境行李,同時亦可將非該區域對 應之出境航班行李,經由輸送設備轉運到該航班之行李處理區域。

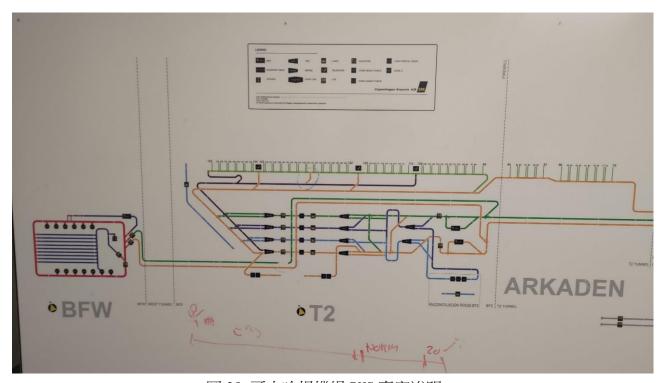


圖 28 哥本哈根機場 BHS 專案說明



圖 29 哥本哈根機場早到暫存區系統



圖 30 哥本哈根機場 BHS 系統(1)



圖 31 哥本哈根機場 BHS 系統(2)

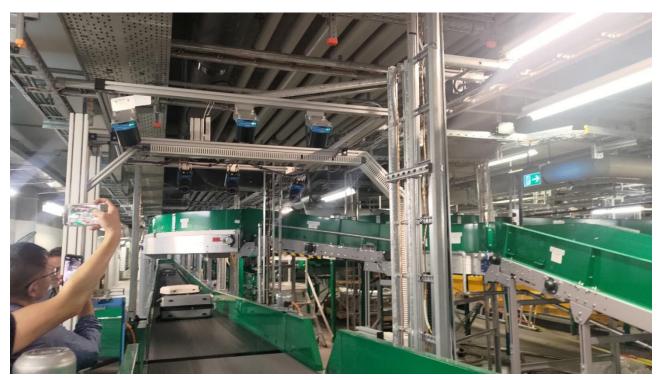


圖 32 哥本哈根機場 BHS 系統(3)



圖 33 哥本哈根機場 BHS 系統(4)

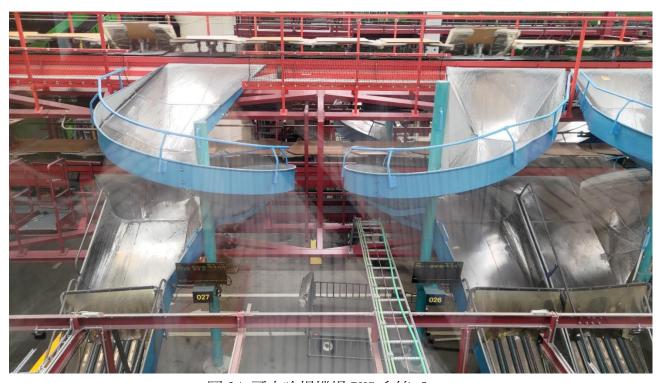


圖 34 哥本哈根機場 BHS 系統(5)



圖 35 哥本哈根機場 BHS 系統(6)

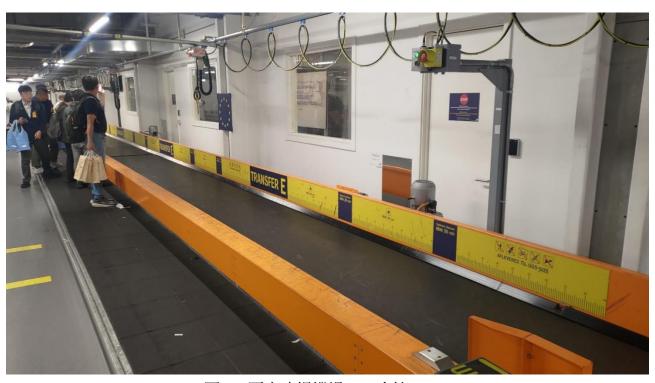


圖 36 哥本哈根機場 BHS 系統(7)

參、 心得與建議

此次廠驗行程在本案承攬廠商廣運機械工程股份有限公司及伯曼集團新加坡分公司(BGS)的協助安排下順利完成,也確保後續設備至現場安裝、測試及運轉之順遂,也使本機場建置之第二航廈行李處理場之主要設備能在預定時程內達到計畫目標。此次行程除針對本案所採用之小車系統執行出廠前之品質實測確認,亦有機會至丹麥哥本哈根機場及挪威奧斯陸機場驗證高速小車系統,這對後續維護及操作皆有相當大的幫助。

参訪BEUMER Group公司丹麥廠,品質管控的方式是值得其他供應商學習的,可以盡量用機械做成自動化,既可以降低錯誤率進而提高品質,這對於經營者是需要多花費多餘的相關費用及機具才能做到目前的規模。

設備組裝展示,得以讓本機場對於相關組裝過程與可能發生之問題有初步想法,並對於未來發生相關障礙時,除委外維護廠商外,亦可由本機場同仁進行初步判斷。

本次廠驗中途經杜拜、哥本哈根、奧胡斯與奧斯陸,並參觀哥本哈根機場及奧斯陸機場,都是可以做為未來發展的重要參考依據,其中包括工程車輛、空橋、報到櫃台、自助報到機,行李轉盤、及現場動線,可作為未來本機場規劃整建相關工程之參考,皆與本機場現有之系統及設備有所差異,透過參訪交流,吸取歐洲先進科技國際機場之知識與經驗,以利本機場航廈設施及服務能與國際接軌,觀摩並了解目前機場在行李處理科技的發展及趨勢,增加專業知識的同時,也將觀察到或學習到的經驗與學習,以增強本機場競爭力,提升機場服務品質。

有關本次廠驗之建議事項,分為高端技術設備之在地化生產,以及系統操作維護策略之精 進兩部分,分別敘述如下:

1. 高端技術設備之在地化生產:經現場參訪高速小車ICS系統,其主要設備為ICS模組,該模組除機械構件外,主要為高效能驅動馬達,驅動皮帶,以及變頻器等,其中驅動馬達可研究由台灣廠商如大同,東元等廠商與原廠合作,提供在地化生產方式,不但可大幅降低採購成本,對於零件採購所需期程亦可降低,對於減少後續維護經費應可產生相當大之幫助,再者,台灣廠商如台達電,研華等系統整合廠商,應可研議與原廠合作,經由技術授權模式,將高速小車ICS系統之控制技術予以轉移,如此一則可以大幅降低原廠技術支援之人力調配。

2.有關系統操作維護策略方面,建議是由較晚建置之設備,需要提供與原有設備之介接解決方案(Solution),並且需要有完整之後續操作維護之配套措施,惟有預先做好相關操作維護策略,方可讓整套BHS系統可以運作順遂。