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航空交通管理
Air Traffic Management

航空交通管理部負責在國際民航組織指定的香港飛行情報區內，提供航空導航服務，包括航空交通服務，通訊、導航及監察服務，航空電訊服務，航班協調，以及搜索和救援（搜救）服務。

The Air Traffic Management Division (ATMD) is responsible for the provision of air navigation services, including air traffic services, communications, navigation, surveillance (CNS) services, aeronautical telecommunication services, schedule coordination and search and rescue (SAR) services within the Hong Kong Flight Information Region (HKFIR) as assigned by ICAO.

航空交通管理
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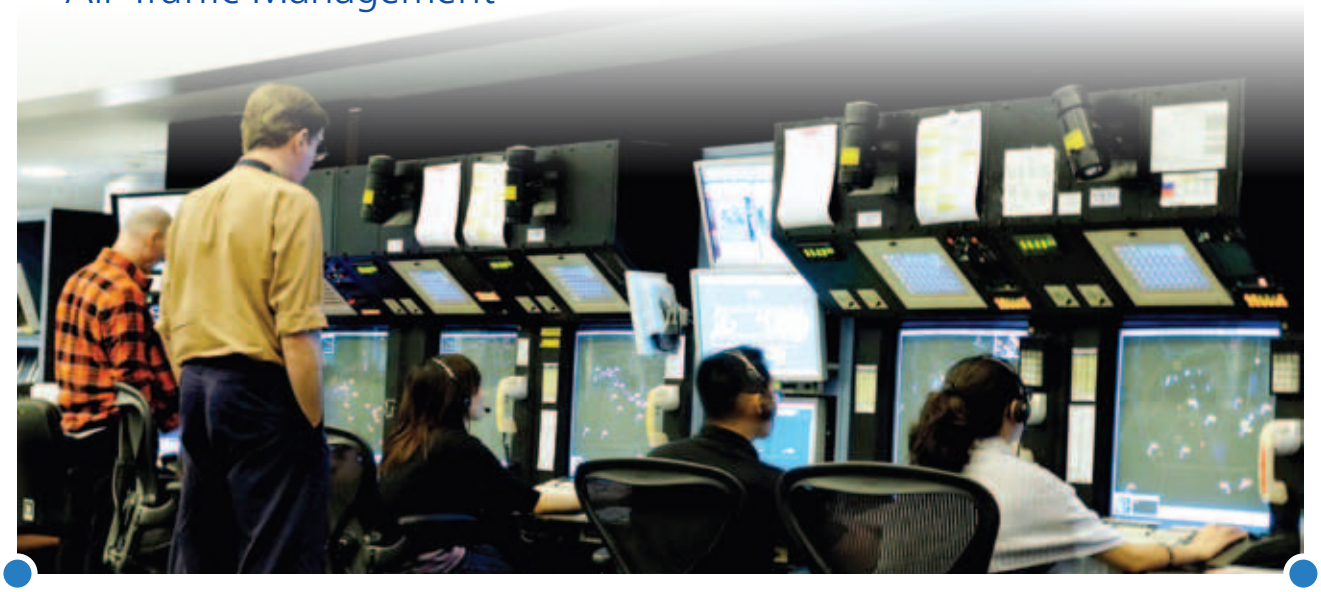


航空交通運作

本財政年度內，航空交通管理部處理了356 183架次在香港國際機場升降的國際及本地航班，並為207 459架次飛越香港飛行情報區的航班（當中包括44 749架次進出澳門國際機場的航班）提供航空交通管制（空管）服務。與上一年度比較，在香港國際機場升降的航班數目增加5%，而飛越香港的航班數目則增加9%。

跑道升降容量

在推行空域和航空交通管理改善措施之後，香港國際機場雙跑道每小時的運作容量，由二零一二年三月的63班遞增至二零一三年三月的64班。香港國際機場更於二零一三年三月二十九日錄得1 172架次航班升降，刷新單日航班升降數目的最高紀錄。

航空交通管制主任執照年度考試和覆核

為維持高水準的空管運作，本部的訓練及安全組每年安排舉行航空交通管制主任（空管主任）的各類空管執照考試。年內，就塔台管制、進場管制和區域管制三個空管組別共舉行了172次考試。此外，本部也向經考核及格的人員頒發助理管制員證書、空管氣象記錄員證書、導師證書、搜救證書和流量管制證書。

AIR TRAFFIC OPERATIONS

During the financial year, ATMD handled 356 183 international and local aircraft movements at Hong Kong International Airport (HKIA). In addition, the Division handled 207 459 flights overflying HKFIR (including 44 749 flights into and out of the Macao International Airport). Compared with the previous year, the number of aircraft movements at HKIA and overflights increased by 5% and 9% respectively.

Runway Capacity

With the introduction of enhancement measures in airspace and air traffic management, the declared capacity per hour for dual runway operations at HKIA increased from 63 movements per hour in March 2012 to 64 movements per hour in March 2013. A new single-day record of 1 172 flight movements operated at the HKIA was set on 29 March 2013.

Annual Examinations and Revalidations of Air Traffic Control Officer Ratings

To maintain a high standard in air traffic control (ATC) operations, the Training and Safety Section of ATMD carried out annual practical examinations on ATC ratings held by Air Traffic Control Officers (ATCOs). In the year, 172 practical examinations were conducted in the three ATC streams – Aerodrome Control, Approach Control and Area Control. In addition, ATMD also issued Assistant Controller Certificates, ATC Meteorological Reporter Certificates, Instructor Certificates, SAR Certificates and Flow Control Certificates to officers who had attained their respective qualifications.

招聘和培訓空管人員

招聘和培訓見習航空交通管制主任

為應付預期的航空交通增長和人手需求，空管人員的招聘和培訓工作必須審慎規劃，嚴謹管理。由於本地就業市場欠缺具備所需資歷的空管主任，民航處通常會招聘見習航空交通管制主任（見習空管主任），經過專門培訓後，再擢升成為空管主任。合資格的申請人須通過一連串甄選步驟，包括才能測驗筆試、工作性格測驗和面試。經初步選出的申請人會在評估中心接受更深入的認知能力測試和性格評估。見習空管主任由入職至全面取得專業資格，必須接受嚴格訓練，過程周密。培訓計劃各階段的訓練單元必須周詳規劃，確保見習空管主任的表現達到既定的進展基準。為符合簽發空管主任執照的要求，各訓練單元內容均包括課堂學習，以及利用空管雷達模擬器或塔台模擬機進行的模擬訓練。只有通過這兩個訓練階段的考核，受訓人員才可在合資格的導師督導下，處理「實況」航空交通，熟習所需技能。受訓人員須再通過另一次最終的「實況」考核，才准獨立工作。培訓見習空管主任成為合資格的管制員，以擔任二級空管主任職位，一般需時五年。

RECRUITMENT AND TRAINING OF ATC STAFF

Recruitment and Training of Student Air Traffic Control Officers

The recruitment and training of ATC staff has to be carefully planned and managed to meet anticipated air traffic growth and manpower needs. As qualified ATCOs are not readily available in the local job market, ATCOs are normally recruited as Student Air Traffic Control Officers (SATCOs) to receive specialised training for progression to ATCOs. Eligible candidates will go through a series of screening steps - written aptitude test, occupational personality quiz and interview. Shortlisted candidates will then attend an Assessment Centre for a more in-depth assessment on cognitive ability and personality traits. SATCOs receive intensive training from entry until the attainment of full professional qualifications. The training programme is a comprehensive process requiring carefully staged training modules to match the established performance development benchmarks. To fulfil ATCO licensing requirements, each module involves classroom lectures and practical training in the ATC Radar Simulator or Aerodrome Simulator. Only when trainees have passed these two training stages can they progress on to handle "live" traffic under the guidance of qualified on the job training instructors to consolidate the necessary skills. After passing the final validation check, the officer will then be allowed to operate independently. The training of a SATCO to become a fully qualified controller at the rank of ATCO II normally takes around five years.

空管主任在航空交通管制中心當值。
ATCO staff working at the Air Traffic Control Centre.

本部同事在塔台模擬機接受訓練。
Divisional staff receiving training at the Control Tower Simulator.

年內，有32名見習空管主任到海外修讀基本空管課程和接受飛行訓練。海外培訓旨在增進受訓人員對空管程序、氣象、雷達操作、飛行原理等方面的航空知識，以及促進個人發展，擴闊他們對空管運作的閱歷。

Within the year, 32 SATCOs attended basic ATC courses and flying training overseas. The overseas training is to enhance their aviation knowledge in ATC procedures, meteorology, radar operations, principles of flight, and facilitate personal development as well as broaden exposure to various aspects of ATC operations.

為加深公眾和求職人士對空管專業的認識，年內，民航處舉辦就業講座，並安排學生參觀本處的設施。

To enable the public and potential applicants to better understand our ATC profession, CAD held career talks and arranged student visits to our facilities throughout the year.

截至二零一三年三月三十一日，空管主任的編制有297人，航空交通事務員則有114人。

As at 31 March 2013, the ATCO and Air Traffic Flight Services Officer establishment numbered at 297 and 114 respectively.

控制塔台全日24小時為進出機場的航機提供航空交通管制服務。
The Air Traffic Control Tower provides round-the-clock ATC services to aircraft operating at the airport.

其他職級的空管培訓

ATC Training for Other Ranks

提供空管培訓是航空交通管理部的重點任務之一。本部在年內持續舉辦多項培訓課程和在職培訓。

Provision of ATC training is one of ATMD's major tasks. Training courses and on-the-job training activities were conducted regularly throughout the year.

年內，本部舉辦了43項空管培訓課程，受訓人員從中取得多項專業資格，獲發57項空管執照。此外，又為81名塔台管制主任舉辦了塔台管制複修課程，以及為159名進場管制主任和區域管制主任舉辦了雷達管制複修課程，以備他們在面對突發情況時，例如航機遇到惡劣天氣或其他緊急事故等，也能應付裕如。本部還挑選了多名資深的空管主任接受不同範疇的進階培訓，包括安全管理系統、新式飛機操作、搜救、空管事故調查、飛機意外調查、安全審計、飛行程序設計、教學技巧和人力資源管理等方面的培訓，開拓他們的眼界，使他們勝任更專門的職務，以及承擔管理和督導責任。

During the year, 43 ATC training courses were conducted, leading to the issuance of 57 ATC ratings and the attainment of various professional ATC qualifications. Aerodrome control refresher training courses were conducted for 81 Aerodrome Control controllers while radar control refresher training courses were held for 159 Approach Control and Area Control controllers. The refresher training aims to ensure controllers' competency in responding to unusual circumstances, such as poor weather operations and aircraft emergencies. In addition, senior ATCOs were selected to attend advanced training on Safety Management Systems (SMS), Operations of Modern Aircraft, SAR, ATC Incident Investigation, Aircraft Accident Investigation, Safety Audits, Flight Procedures Design, Instructional Techniques and Human Resources Management, etc. to broaden their horizon, and enable them to undertake more specialised duties as well as taking on management and supervisory responsibilities.

其他培訓

除了安排內部空管培訓課程外，本部也與香港民航訓練中心定期合辦航空交通管理概論課程，讓業界伙伴和市民更深入了解空管工作。課程舉辦經年，一直深受歡迎。

Other Training Offered

Apart from the programmed in-house ATC training courses, ATMD also conducted an Air Traffic Management Introductory Course in conjunction with the Hong Kong Civil Aviation Training Centre for industry partners and the public for a better appreciation of air traffic management functions. The course is conducted regularly and has been well received.

新空管程序

NEW ATC PROCEDURES

在相鄰跑道以儀表着陸系統進場的航機採用2.5海里間隔最低標準

經全面評估安全因素後，在相鄰跑道以儀表着陸系統進場航機的間隔最低標準，於二零一二年四月二日起，由3海里修訂為2.5海里。新修訂的間隔最低標準，讓空管人員可以更緊密地安排抵港航班在安全的情況下降落，從而盡用跑道容量。

Application of 2.5 Nautical Miles (NM) Separation Minimum between Aircraft on Adjacent ILS Approaches

Having conducted comprehensive safety assessment, the separation minimum between aircraft on adjacent ILS approaches was revised from 3 NM to 2.5 NM and became operational on 2 April 2012. The revised separation minimum would facilitate air traffic controllers delivering the minimum inter-arrival spacing in a safe manner, which in turn would maximise runway throughput.

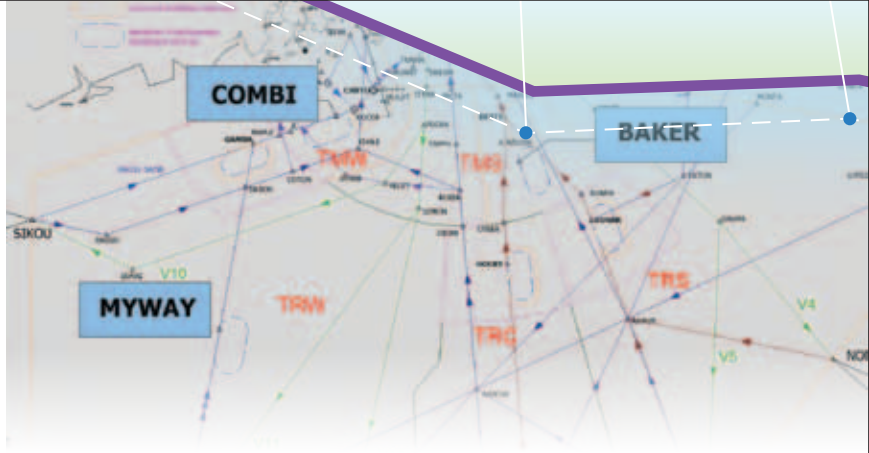
空中等候區轉移程序

香港空域終端區內設有三個主要空中等候區，以供從東面、南面和西面進入香港飛行情報區的抵港航班在繁忙時間等候排序降落。鑑於航班從三面抵港的數量分布並不平均，個別空中等候區的航空交通需求量有時會超出設定容量。為應付這些情況，本部於二零一二年四月五日實施空中等候區轉移程序。如預計航空交通會集中在某個空中等候區出現，空管單位便會啟動轉移程序，讓空管人員可以根據標準路徑和飛行高度，有秩序地從繁忙的空中等候區疏導航班到其他等候區處理。藉着這個程序，空管單位得以為數量日增的航班，繼續提供安全和有效率的航空導航服務。

Stack Swapping Procedure

There are three primary holding patterns strategically located and established in the terminal airspace to cater for flights arriving from the east, south and west of the HKFIR that are required to join and hold in the stack awaiting a landing sequence because of traffic congestion. To address the situation when demand exceeds the designed capacity of a particular holding pattern as a result of unevenly distributed arriving traffic pattern, ATMD implemented a Stack Swapping Procedure on 5 April 2012 for ATC to divert flights from one holding pattern to another in an orderly fashion following standardised tracks and flight levels. The procedure is activated whenever traffic overflow in a holding pattern is anticipated. It effectively prepares ATC to continue providing a safe and efficient air navigation service in managing the ever increasing air traffic.

如預計航空交通會集中在某個等候區出現，空中等候區轉移程序便會啟動。
Stack Swapping Procedure is activated whenever traffic overflow in a holding pattern is anticipated.



設立應急空中等候區後，即使天氣情況惡劣，空管單位也可以在確保航空安全的情況下，有條理地管理航空交通。
Contingency holding patterns allow ATC to manage traffic under challenging weather situations in a safe and organised manner.

惡劣天氣情況下空中交通管理的應急措施

在廣泛惡劣天氣影響下管理航空交通，對空管單位是一大考驗。為此，本部於二零一二年四月五日增設一系列應急航機空中等候區，其後又於二零一二年六月三十日實施優化的應急空中等候區空管程序。每當主要空中等候區受到惡劣天氣影響而不能使用時，空管單位便會指示航機在應急空中等候區等候。這樣，即使天氣情況惡劣，空管單位也可以在確保航空安全的情況下，有條理地管理航空交通。

Contingency Measures for Traffic Handling in Adverse Weather Situations

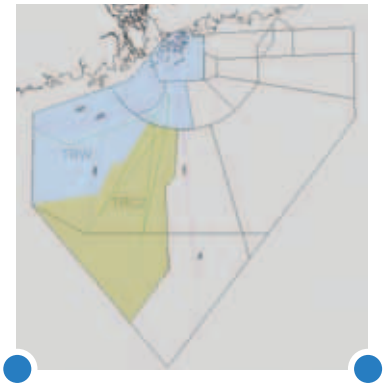
Handling air traffic under extensive adverse weather has always been a challenge for ATC. ATMD took the initiative to establish a series of additional aircraft contingency holding patterns on 5 April 2012 and streamlined the procedures for using contingency holding patterns on 30 June 2012. When the primary holding patterns are severely affected by weather rendering them not usable, ATC may instruct the flights to hold at these contingency holding patterns. These measures allow ATC to manage traffic under challenging weather situations in a safe and organised manner.

區域扇區上層與下層運作模式和重新劃分西部空域

在每天不同時段，各個空管扇區的航空交通量各異。二零一二年六月十二日，本部設立區域管制扇區上、下層運作模式，把航路空域分為一個上層扇區和兩個下層扇區。這種空域配置模式於午夜之後採用，以便處理這個時段大量從東南亞地區起飛，飛越香港空域前往東北亞地區的航班。此外，本部於二零一三年一月三十日重新劃分香港西部航路空域並建立一個新的扇區，以便處理這個區域不斷增加的航班。上述程序為空管單位提供更多配置空域的模式，方便空管人員因應不同扇區當前的航空交通需求量，採取最有效率的運作模式。

Upper and Lower Sectors Mode of Operations and Western Airspace Sectorisation

The traffic volume at different ATC sectors varies throughout the day. On 12 June 2012, ATMD introduced the Upper and Lower Sectors Mode of Operations in Area Control which segregates the en-route airspace into an upper sector and two lower sectors. This airspace configuration is applied after midnight to cater for the heavy traffic demand, typically from flights connecting South East Asia and North East Asia that transit the Hong Kong airspace. In addition, ATMD established a new sector in the western part of the enroute airspace on 30 January 2013 to handle the growing traffic in this area. These procedures provide ATC the options to configure the airspace dynamically to suit specific traffic patterns such that traffic handling efficiency can be optimised.



本部重新劃分香港西部航路空域並建立一個新的扇區，提供更多配置空域的模式，方便空管人員因應不同扇區當前的航空交通需求量，採取最有效率的運作模式。
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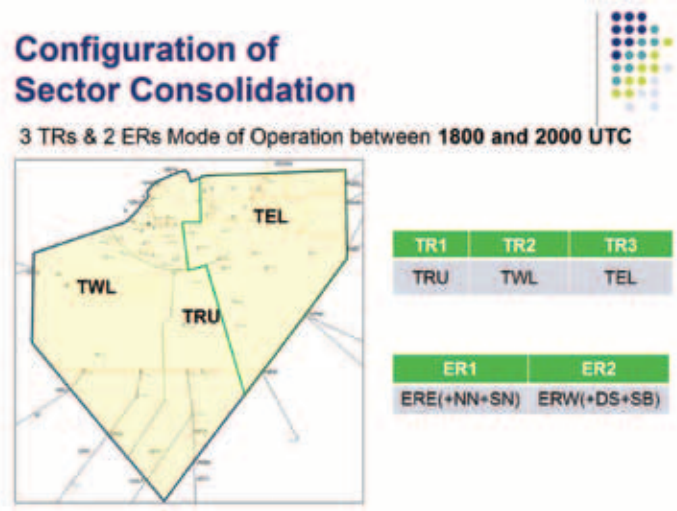
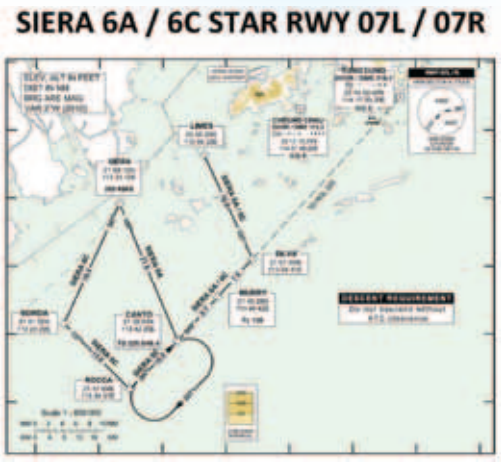
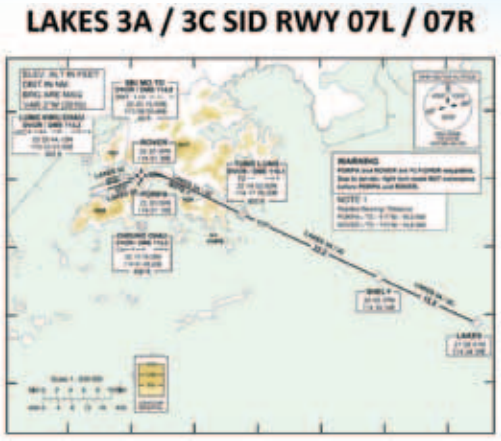


本部設立區域管制扇區上、下層運作模式，以便處理大量從東南亞地區起飛，飛越香港空域前往東北亞地區的航班。
ATMD introduced the Upper and Lower Sectors Mode of Operations in Area Control to cater for the heavy traffic demand, typically from flights connecting South East Asia and North East Asia that transit the Hong Kong airspace.





新的性能導航飛行程序採用衞星導航技術和RNP 1規範，優化香港國際機場的標準儀表離場和進場程序。
The new PBN flight procedures utilise satellite navigation technology and RNP 1 specification to enhance the SID and STAR procedures for HKIA.

實施RNP 1標準儀表離場程序和標準儀表進場程序

二零一三年一月十日，民航處在香港終端區實施新的性能導航飛行程序。新飛行程序採用衞星導航技術和RNP 1規範，優化香港國際機場的標準儀表離場和進場程序，簡化航路結構，把進入香港國際機場的標準儀表進場程序數目，從24個大幅減少至10個，大大提升空管的整體運作效率。

Implementation of RNP 1 Standard Instrument Departure (SID) and Standard Instrument Arrival (STAR) Procedures

CAD has implemented new Performance-Based Navigation (PBN) flight procedures in Terminal Area since 10 January 2013. The new flight procedures utilise satellite navigation technology and RNP 1 specification to enhance the SID and STAR procedures for HKIA. As a result, the number of STARs for flights operating into HKIA has greatly reduced from 24 to 10. It has thus enhanced the overall ATC operational efficiency.

珠江三角洲（珠三角）地區航空交通管理計劃

年內，香港民航處、國家民用航空局與澳門民航局組成的珠三角地區空管規劃與實施三方工作組，繼續研究及推進包括飛行程序、航道和設置相關系統的優化措施，目標是加強三方的協調，提高珠三角空域使用效能及航空交通管理效率，從而提升區域航空運輸能力。

AIR TRAFFIC MANAGEMENT PLAN FOR THE PEARL RIVER DELTA (PRD) REGION

During the year, the PRD Air Traffic Management Planning and Implementation Tripartite Working Group formed by the Hong Kong CAD, the Civil Aviation Administration of China (CAAC) and the Macao Civil Aviation Authority continued to study and pursue enhancement measures. These include flight procedures, air routes, as well as related ancillary systems provision that will enhance collaboration among the three sides and improve airspace utilisation and air traffic management efficieny in the PRD region so as to increase regional air transport capability.

在珠江三角洲地區空中交通管理規劃與實施方案專題工作組會議上，三方工作組商討如何進一步推動優化珠三角空管程序與空域結構。
The Tripartite Working Group discussed ATC procedures and airspace enhancement measures during the Pearl River Delta Region Air Traffic Management Planning and Implementation Supervisory Group Meeting.

電訊服務

本部航空通訊組年內處理的資訊量輕微上升，其中通過固定航空通訊服務處理的訊息達38 411 677個，較上一年度增加0.45%。至於航空氣象廣播服務，年內為航機提供氣象報告合共335 771次，數字與上年度相若。

TELECOMMUNICATIONS SERVICES

The total number of messages handled by the Telecommunications Unit of the Division increased slightly in the year. On Aeronautical Fixed Service, 38 411 677 messages were handled, representing an increase of 0.45% compared with last year. On Aeronautical Broadcast Service, the total number of weather messages broadcast to aircraft in flight amounted to 335 771, which was very close to the figure last year.

航班協調

自二零零八年成立以來，香港機場航班協調辦公室一直根據國際航空運輸協會發行的《世界航班時刻準則》，採用中立、透明和非歧視的協調機制，確保高效使用有限的機場資源。年內，航班協調辦公室共處理372 000宗香港國際機場的航班升降時刻申請。

自二零一二年七月三日開始，航班協調辦公室由航班事務部調編至航空交通管理部，以方便與空管的直接溝通，從而提高時刻分配工作的效率。

SCHEDULE COORDINATION

Since its establishment in 2008, the Hong Kong Schedule Coordination Office (HKSCO) has adopted a neutral, transparent and non-discriminatory schedule coordination mechanism in accordance with the International Air Transport Association's Worldwide Slot Guidelines to ensure the efficient utilisation of scarce airport resources. During the year, the HKSCO processed 372 000 applications for slots at HKIA.

With effect from 3 July 2012, HKSCO was re-deployed from the Air Services Division to ATMD with a view to facilitating its direct communications with ATC in order to enhance the efficiency in slot allocation.

安全管理系統

航空交通管理部繼續致力推行和優化安全管理系統，確保提供安全的航空交通服務。本部實施的安全風險管理和安全保證都符合國際民航組織的條文和民航處的監管規定。在對航空交通管理系統、儀器和程序作出重大變動前，本部會先進行安全風險評估和採取緩解措施。

就此，民航處舉辦了兩個「制定安全案例」工作坊，以提升參與更換空管系統計劃的人員制定安全案例的能力。本部也於年內就主要職能範疇進行了四次內部安全審計，確保安全管理系統不斷改善，精益求精。

SAFETY MANAGEMENT SYSTEM

ATMD has maintained its effort in the implementation and continuous optimisation of its SMS to ensure that a high level of safety is maintained in the provision of air traffic services. Safety risk management and safety assurance are applied in accordance with ICAO provisions and CAD regulatory requirements. Safety risk assessments are conducted and mitigation processes are introduced before any significant changes to the air traffic management systems, equipment and procedures can be implemented.

In this connection, two Safety Case Development Workshops were conducted by CAD to enhance the competent level of CAD staff in safety case development in association with the Replacement of ATC System Project. Four internal safety audits were also carried out on different key functional areas during the report period to ensure continuous SMS improvement.

二零一二年十二月，本處聯同政府其他部門和中國人民解放軍駐港部隊，舉行搜救演習。
A SAR Exercise was conducted by the department with the participation from various government departments and the People's Liberation Army Hong Kong Garrison in December 2012.

本部繼續為員工提供合適的安全管理系統培訓，推廣安全文化。我們根據有系統的安全管理系統培訓計劃，向所有參加內部培訓課程的學員簡介安全管理系統，以便在學員入職初期灌輸安全管理概念。

In promoting safety culture, ATMD continued its effort to provide staff with appropriate SMS training. A structured SMS training programme has been put in place to provide SMS briefings to all trainees attending internal training courses to instil the concept of safety management during the early stage of their career.

搜救服務

SEARCH AND RESCUE (SAR) SERVICES

年內，共有九名空管主任完成搜救培訓課程，取得搜救資格。

During the year, nine ATCOs completed their SAR training and obtained their SAR qualification.

本處於二零一二年十二月舉行一次搜救演習，參與的政府部門包括水警、消防處、海事處和政府飛行服務隊。中國人民解放軍駐港部隊也積極參與這次演習。

In December 2012, a SAR Exercise was conducted by the division with the participation from various government departments including the Government Flying Service, Marine Police, Fire Services Department and Marine Department. The People's Liberation Army Hong Kong Garrison also took an active role in the exercise.

一如以往，本部繼續派員出席本地和國際搜救會議，以及參與香港機場飛機緊急事故演習，以維持所需的搜救效率並掌握相關知識。

In an effort to upkeep the SAR efficiency and associated knowledge, the division participated in local and international SAR meetings and attended airport and aircraft emergency drills.

海外空管會議和研討會

OVERSEAS ATC MEETINGS AND CONFERENCES

年內，航空交通管理部繼續積極參與由國際民航組織、民用空中航行服務組織和其他航空機關舉辦的海外會議及研討會，交流和推動合作，促進亞太區以至全球航空交通管理的持續發展。

During the year, the Division continued to actively participate in overseas meetings, seminars and conferences organised by ICAO, Civil Air Navigation Services Organisation and other aviation authorities to exchange views and foster cooperation with our international counterparts. This active networking process contributed to the continuous development of air traffic management regionally and globally.