航空交通管理
Air Traffic Management

航空交通管理部負責為在香港飛行情報區內航行的民航機提供空中導航服務,當中包括航空交通服務,通訊、導航和監察,以及搜索和救援。為履行使命,在香港飛行情報區內提供持續可靠的導航服務,並維持航空交通高效有序的運作,本部亦肩負培訓本地航空交通管制(空管)人員、提供航空電訊服務、協調航班和設計空管程序的責任。

The Air Traffic Management Division (ATMD) is responsible for the provision of air navigation services to civil aircraft operating within the Hong Kong Flight Information Region (HKFIR). The services include air traffic services, communications, navigation and surveillance as well as search and rescue. With the mission of providing reliable and sustainable air navigation services and maintaining efficient and orderly air traffic operations within HKFIR, ATMD is also responsible for the training of air traffic control (ATC) personnel, provision of aeronautical telecommunication services, flight schedule coordination and the design of ATC procedures.

航空交通管理
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航空指揮塔為進出香港國際機場的航機提供空管服務。

The Air Traffic Control Tower provides air traffic control services to aircraft operating at Hong Kong International Airport.

航空交通運作

在本財政年度內，航空交通管理部處理了411 513架次在香港國際機場升降的國際及本地航班，並為258 968架次飛越香港飛行情報區的航班（當中包括55 825架次往來澳門國際機場的航班）提供空管服務。與上一年度比較，在香港國際機場升降的航班數目增加了3.6%，而飛越香港的航班數目則增加了10.6%。

跑道升降容量

通過進一步優化飛行程序和空管程序，香港國際機場雙跑道的最高容量，已於年內提升至每小時68架次。香港國際機場更於二零一六年二月六日，處理了1 227架次航班升降，刷新單日航班升降紀錄。

航空交通管制主任執照考試和覆核

為維持空管運作的表現和安全標準，本部的訓練及安全組為航空交通管制主任（空管主任）安排各類實務考試。年內，就塔台管制、進場管制和區域管制三個空管範疇共舉行了244次實務考試。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、在職培訓導師證書和流量管制證書。

AIR TRAFFIC OPERATIONS

During the financial year, ATMD handled 411 513 international and local aircraft movements at Hong Kong International Airport (HKIA). In addition, the Division handled 258 968 flights overflying the HKFIR (including 55 825 flights into and out of Macao International Airport). Compared with the previous year, the number of aircraft movements at HKIA and overflights increased by 3.6% and 10.6% respectively.

Runway Capacity

Further enhancements to flight procedures and ATC procedures enabled the handling capacity for the two runways at HKIA to be increased to a maximum of 68 movements per hour within the year. On 6 February 2016, a total of 1 227 flight movements were handled at HKIA, setting a new single day record during the year.

Examinations and Revalidations of Air Traffic Control Officer Ratings

The Training and Safety Section of ATMD carried out practical examinations on Air Traffic Control Officers (ATCOs) to ensure that the required performance and safety standards in ATC operations are maintained. In the year, 244 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, On-the-job Instructor Certificates and Flow Control Certificates to officers who had attained these qualifications.

招聘和培訓空管人員

招聘和培訓見習空管主任

招聘和培訓見習空管主任的工作必須審慎規劃和管理，以配合預期的航空交通增長和人手需求。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空管主任，經過專門培訓後，再擢升為空管主任。

在見習空管主任的招聘程序中，合資格的申請人必須通過一系列的評估，包括才能測驗筆試、工作性格測驗和面試。通過上述各項評估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。

RECRUITMENT AND TRAINING OF ATC STAFF

Recruitment and Training of Student Air Traffic Control Officers (SATCOs)

The recruitment and training of ATC staff have 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, individuals are normally recruited as SATCOs. After specialised training, they will progress from SATCOs to ATCOs.

During the recruitment of SATCOs, eligible candidates will go through a series of assessments including a written aptitude test, an occupational personality questionnaire and an interview. Further in-depth assessment on cognitive ability and personality traits will be conducted in the Assessment Centre for candidates who pass all the assessments mentioned.

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見習空管主任的培訓需要周詳規劃，務使受訓學員的表現能達到既定的進展基準。培訓計劃由不同階段的訓練單元組成，以確保學員充分掌握所學技能後，才開始接受另一單元的培訓。各個訓練單元均包括課堂學習、利用空管雷達模擬器或塔台模擬機進行模擬訓練，以及於工作崗位接受在職培訓。受訓人員必須通過考核，才會獲准獨立工作。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的職位，一般需時六年左右。

除本地培訓外，見習空管主任也會到海外修讀基本空管課程，內容廣泛，包括空管程序、氣象、雷達操作、飛行原理等航空知識，以擴闊他們在空管運作方面的閱歷。在本財政年度內，共有18名見習空管主任完成海外基本空管課程，而另有9名見習空管主任將在下一個財政年度內接受該等培訓。

截至二零一六年三月三十一日，空管主任的編制有279人，為空管主任提供支援的航空交通事務員則有118人。

The training programme of SATCOs is carefully designed and arranged to meet the established performance development benchmarks. It comprises staged training modules to ensure adequate consolidation before the next module. Each training module includes classroom lectures, practical training in the ATC Radar Simulator or Aerodrome Simulator, and on-the-job training at operational positions. After passing the validation check, the officer will 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 six years.

Apart from local training, SATCOs also attend overseas basic ATC courses. A wide coverage of aviation topics including ATC procedures, meteorology, radar operations and principles of flight will be introduced to broaden their exposure to various aspects of ATC operations. A total of 18 SATCOs completed their overseas basic ATC courses in this financial year and 9 more SATCOs would undergo such training in the next financial year.

As at 31 March 2016, the ATCO and Air Traffic Flight Services Officer (supporting staff to ATCO) establishment numbered at 279 and 118 respectively.

航空交通管制主任利用雷達協助指揮航班。
Air Traffic Controllers direct aircraft with the assistance of radar.

其他職級的空管培訓

為人員提供空管專業培訓是航空交通管理部的重點任務之一。本部在年內定期舉辦多項培訓課程和在職培訓活動。

年內，本部舉辦了31項專業空管培訓課程，受訓人員從中取得多項專業空管資格，期間獲發的空管執照達33項。此外，又為87名塔台管制員舉辦塔台管制複修課程，讓他們在遇上突發情況時，例如在惡劣天氣下，或航機發生緊急事故時，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、飛機意外調查和飛行程序設計等方面，以開拓他們的眼界，使他們勝任更專門的職務，以及承擔管理和督導責任。

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合作，舉辦航空交通管理概論課程，讓業界伙伴和市民更深入了解航空交通管理的工作。課程定期舉辦，一直深受歡迎。

ATC Training for Other Ranks

One of ATMD's major tasks is the provision of professional ATC training to staff. Training courses and on-the-job training activities were conducted regularly throughout the year.

During the year, 31 professional ATC training courses were conducted, leading to the issuance of 33 ATC ratings and the attainment of various professional ATC qualifications. Aerodrome refresher training was conducted for 87 Aerodrome Control personnel. 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 in Safety Management System, Operations of Modern Aircraft, Aircraft Accident Investigation, and Flight Procedures Design, etc., to broaden their horizons, and enable them to undertake more specialised duties as well as management and supervisory responsibilities.

Other Training Offered

Apart from the 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 to have a better appreciation of air traffic management functions. The course is conducted regularly and has been well received.

塔台模擬機為學員提供迫真的實習訓練。
Aerodrome Simulator emulates different training scenario with great realism.

新空管／飛行程序

在過去數年，本部一直致力促使香港國際機場達到最高跑道容量。其中一項主要先決條件，是減少降落航機平均佔用跑道的時間，以縮短抵港航班的間距。在二零一五年第三季，本部的一項研究顯示，在民航處和香港機場管理局協力推行提高機師意識的計劃後，航機佔用跑道的時間已經減少至適當水平，使若干類型飛機的間距縮短至3.5海浬，香港國際機場得以在繁忙時段每小時可以處理34班抵港航班，並在二零一五年十月達到每小時68架次的最高跑道容量。

「要求授權的所需導航性能進場程序」

為提升香港國際機場在天氣不利情況下處理抵港航班的能力，本部於二零一五年年中起為07L/R跑道訂定了兩個「要求授權的所需導航性能進場程序」。新的程序利用衛星技術和航機上先進的導航性能，可以克服複雜地形和空域環境的限制，在香港國際機場提供一條從北方進場的航道，以便航機因惡劣天氣而不能從南方進場時使用。新的程序可供符合相關運作要求並獲民航處特別授權的航空公司使用。

實施所需導航性能(RNP 1)標準儀表離場／進場程序

按照亞太區落實基於性能導航(PBN)的地區發展計劃，民航處於二零一三年起實施RNP 1標準儀表離場/進場程序。為了讓營運者有更多時間將機隊升級和取得所需批准，民航處保留了相應的傳統程序。鑑於在香港國際機場運作的飛機大多已取得RNP1的批准，過渡工作順利完成，因此由二零一五年十一月十二日起，RNP 1程序完全取代傳統程序。成功實施RNP 1程序，有助日後優化航道和空域設計，從而達至提升空域效率等運作效益。

NEW ATC / FLIGHT PROCEDURES

ATMD has been working towards achieving the maximum runway capacity of HKIA over the past few years. One of the main prerequisites was a reduction in the average runway occupancy time for landings, to enable arriving aircraft to be spaced closer together. In the third quarter of 2015, ATMD completed a study which showed that the runway occupancy time had lowered to a satisfactory level, following a concerted pilot awareness campaign by both CAD and the Airport Authority Hong Kong. The lowering of runway occupancy time allowed a reduction in spacing to 3.5 nautical miles between certain categories of aircraft. The spacing reduction resulted in 34 arrival flights per hour to be handled at peak hours and the maximum hourly runway capacity at HKIA, i.e. 68 movements per hour, was reached in October 2015.

Required Navigation Performance Authorisation Required Approach (RNP AR APCH) Procedures

With an aim to enhance the accessibility to HKIA in unfavourable weather conditions, two new RNP AR APCH procedures for RWY 07L/R have been made available since mid-2015. The new procedures, which utilise satellite technology and advanced on-board navigation capability to overcome complex terrain and airspace environment, provide an approach path to the north of HKIA to cater for circumstances when weather precludes the conduct of approach from the south. They are available to airline operators which meet relevant operational requirements and have obtained special authorisation from CAD.

Implementation of RNP 1 Standard Instrument Departure (SID)/Standard Instrument Arrival (STAR) procedures

In line with the regional roadmap to implement performance-based navigation (PBN) in the Asia-Pacific Region, CAD has implemented RNP 1 SID/STAR procedures since 2013. In order to allow more time for operators to upgrade their fleet and obtain necessary approval, CAD retained the respective conventional procedures. Considering the majority of aircraft operating at HKIA have become RNP 1 approved and the transition has been successfully concluded, with effect from 12 November 2015, the RNP 1 procedures have completely taken over conventional procedures. The successful implementation of RNP 1 procedures would facilitate future enhancement of flight paths and airspace design, thereby offering operational benefits including enhanced airspace efficiency.

珠江三角洲（珠三角）地區航空交通管理計劃

為了全面落實《珠三角地區空中交通管理規劃與實施方案》（《方案》）內的優化措施，民航處一直透過三方工作組與國家民航局和澳門民航局保持緊密聯繫，商討分階段推展各項優化措施。年內，民航處與國家民航局達成協議，在香港和廣州兩個飛行情報區之間增設往來華東地區航道及一個名為「LELIM」的空管移交點，以供往來港澳及華東地區的航班使用。

此外，三方亦分別在二零一五年五月、二零一六年一月及三月召開了高層會議。在二零一六年三月二十三日在香港召開的一次高層會議中，國家民航局、民航處和澳門民航局進一步討論有關優化珠三角地區空管程序與空域結構，以及提升該地區空域使用效率等多項議題，並為今後強化高層恆常合作建立基礎。在三方不斷合作下，珠三角地區各機場將能健康有序發展，而香港國際機場三跑道系統亦能夠發揮最大效用，以期達至每小時處理102班航班的長遠目標。

民航處會繼續積極促進珠三角地區航空交通管理的合作交流，推展和落實其他優化區內空域設計和管理的措施，以配合區內未來航空交通量的快速增長。

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

With the aim of full implementation of the enhancement measures as stipulated in the PRD Region Air Traffic Management Planning and Implementation Plan (the Plan), CAD has been maintaining close liaison with the Civil Aviation Administration of China (CAAC) and the Civil Aviation Authority of Macau (CAAM) through the Tripartite Working Group (TWG) to discuss the phased implementation of the enhancement measures. During the year, CAD reached an agreement with the CAAC in which new air routes for the eastern part of the Mainland and associated additional handover point between the Hong Kong and Guangzhou Flight Information Regions (FIRs) called LELIM were established for flights operating between Hong Kong, Macau and the eastern part of the Mainland.

Furthermore, three high-level meetings were also held in May 2015 as well as January and March 2016 respectively. The high-level meeting held in Hong Kong on 23 March 2016 between CAAC, CAD and CAAM further discussed various PRD airspace enhancement issues on flight procedures and airspace structure, and optimisation of the airspace utilisation in the region, and to pave the way for further high-level co-operation in the future. Continued cooperation among the three sides would bring about healthy and orderly development of the airports in the PRD region and enable the 3RS of the HKIA to maximise its potential and to achieve the target runway capacity of 102 movements per hour in the long run.

CAD will continue to proactively promote exchanges on PRD region air traffic management co-operation. It will also put forward and implement other measures to further rationalise the airspace management in the region to cope with the rapid growth in the volume of air traffic in future.

電訊服務

本部航空通訊組年內處理的資訊量顯著增長，其中通過固定航空通訊服務處理的訊息達53 586 775個，較上一年度增加達17%。至於航空氣象廣播服務，年內為航機提供氣象報告合共351 506次，與去年度相比增加5%。

航班時刻分配

按照國際航空運輸協會發布的《世界航班時刻準則》，香港機場航班協調辦公室以公平、中立、高透明度的方式分配機場航班時刻，以確保現有的機場基礎設施得以善用。年內，於香港國際機場運作的航空公司及其他飛機營運者共獲分配418 061個航班時刻，達到機場實際最高容量的99.5%。香港機場航班協調辦公室所處理的航班時刻申請數量，較去年同期增加約4%。

TELECOMMUNICATIONS SERVICES

The total number of messages handled by the Telecommunications Unit of the Division increased considerably in the year. On Aeronautical Fixed Service, 53 586 775 messages were handled, representing an increase of 17% as compared with last year. On Aeronautical Broadcast Service, the total number of weather messages broadcast to aircraft in flight amounted to 351 506, representing a 5% increase compared with last year.

SLOT ALLOCATION

In accordance with the International Air Transport Association's Worldwide Slot Guidelines, the Hong Kong Schedule Coordination Office (HKSCO) managed slot allocation in a neutral, transparent and fair manner, with a view to ensuring the efficient utilisation of existing airport infrastructure. During the year, airlines and other aircraft operators at HKIA were allocated a total of 418 061 slots, reaching 99.5% of the airport maximum practical capacity. The number of slot applications processed by HKSCO also increased by about 4% compared with the same period last year.

長程搜救演習。
Long range search and rescue exercise.

安全管理系統

航空交通管理部繼續致力推行安全管理系統，以期全面提升航空安全表現。為此，本部根據國際民用航空組織（國際民航組織）的條文和民航處的監管規定，積極推行安全風險管理和安全保證。在航空交通管理系統、儀器或程序作出重大變動前，本部會先評估安全風險和採取適當的緩解措施。

為監察與衡量安全績效表現，本部每季編製安全績效目標報告和安全績效指標報告，並呈交予負責監管本部安全績效的單位，即航空交通管理標準組審閱。此外，為確保安全管理系統不斷改進，年內本部就各個主要職能範疇進行了三次內部安全審查。本部又繼續支援航空交通管理標準組，協助其執行監管工作。

此外，本部繼續為員工提供合適的安全管理系統培訓，推廣重視安全的文化。除空管的基本培訓和複訓單元外，本部還推行了周詳的安全管理系統培訓計劃，向所有空管人員灌輸安全管理概念。

飛航搜索和救援（搜救）服務

本部與區域和國際搜救機關保持密切聯繫，並繼續參加本地和國際搜救會議及研討會。在六個政府部門及其它機構的參與下，本部於二零一五年十二月十五日成功舉辦了一次長程搜救演習。此外，本部亦恆常派員參與機場和飛機緊急事故演習。

海外航空會議和研討會

航空交通管理部於年內繼續積極參與推動地區和國際航空管理發展的會議和研討會。大部分的會議和研討會由國際民航組織、民用空中航行服務組織和區內其他航空機關舉辦。

SAFETY MANAGEMENT SYSTEM (SMS)

ATMD continued putting in substantial efforts to enhance the overall aeronautical safety performance through effective implementation of its SMS. This is accomplished by proactive application of safety risk management and safety assurance in compliance with the provisions of the International Civil Aviation Organization (ICAO) and regulatory requirement of the department. Safety risk assessment is conducted and appropriate mitigation measures are introduced before any significant changes to the air traffic management systems, equipment or procedures can be implemented.

Reports on Safety Performance Targets and Safety Performance Indicators were compiled and submitted to the regulatory office overseeing the safety performance of ATMD, i.e. the Air Traffic Management Standards Office (ATMSO), on a quarterly basis for safety performance monitoring and measurement. To ensure the continuous improvement in safety performance, three internal audits were conducted in the year on different key functional areas of ATMD. In the meantime, the Division continued to provide necessary support to the ATMSO in facilitating regulatory oversight activities.

Besides, ATMD maintained its efforts to provide staff with appropriate SMS training in order to promote safety culture. A structured SMS training programme has been put in place to supplement the basic and recurrent ATC training modules in order to instil the concept of safety management in all ATC personnel.

AERONAUTICAL SEARCH AND RESCUE (SAR) SERVICES

ATMD maintained close liaison with regional and international SAR authorities and continued to participate in local and international aeronautical SAR meetings and seminars. A long range SAR exercise was successfully conducted on 15 December 2015 with participation of six Government departments and other organisations. ATMD also regularly attended airport and aircraft emergency drills.

OVERSEAS AERONAUTICAL MEETINGS AND CONFERENCES

During the year, ATMD continued to actively participate in meetings, seminars and conferences which promoted the development of air traffic management in the region and globally. Most of the meetings and seminars were organised by the ICAO, Civil Air Navigation Services Organisation and other aviation authorities of the Asia Pacific Region.