

# 航空交通管理

## AIR TRAFFIC MANAGEMENT





航空交通管理部負責在國際民用航空組織(國際民航組織)指定的香港飛行情報區內，提供航空交通管制(空管)、飛行情報及飛機事故警報服務。

The Air Traffic Management Division (ATMD) is responsible for the provision of air traffic control (ATC) service, flight information service and alerting service within the Hong Kong Flight Information Region (FIR) as assigned by the International Civil Aviation Organization (ICAO).

# 航空交通管理 AIR TRAFFIC MANAGEMENT

## 航空交通運作

本財政年度內，本部共處理了297 516架次在香港國際機場升降的國際及本地航班，並為105 528架次飛越香港飛行情報區，以及42 045架次進出澳門國際機場的航班提供空管服務。與上一財政年度比較，由於二零零八年年中以後航空旅客及貨運量受全球金融海嘯影響而下降，在香港國際機場升降及飛越香港的航班分別減少1%和6.1%。

## 跑道升降容量

隨著航空交通管理和空域管理不斷改善，香港國際機場雙跑道運作容量自二零零八年十月起遞增至每小時56班，在二零零九年三月進一步遞增至每小時57班。



機場雙跑道運作容量自二零零九年三月遞增至每小時57班。  
*The declared runway capacity for dual runway operations was increased to 57 movements per hour since March 2009.*

## 空管主任執照考試和覆核

為維持高水準的空管，本部的訓練及安全組每年安排航空交通管制主任(空管主任)的各類執照考試。就塔臺管制、進場管制和區域管制這三個組別進行的考試共有157次。

此外，本部向考核合格的人員頒發助理管制員證書、氣象觀察員證書、導師證書和搜索及拯救證書。

## AIR TRAFFIC OPERATIONS

During the financial year, the Division handled a total of 297 516 international and local aircraft movements at the Hong Kong International Airport (HKIA). In addition, the Division handled 105 528 flights overflying the Hong Kong FIR and 42 045 flights into and out of the Macao International Airport. Compared to the previous financial year, the number of aircraft movements at the HKIA and overflights decreased by 1 per cent and 6.1 per cent respectively. The overall decrease in movement was mainly due to the reduced demand for passenger and freight capacity as a result of the global financial tsunami from mid 2008.

## Runway capacity

With the continued enhancement to air traffic management and airspace management, the declared runway capacity was progressively increased to 56 movements per hour on dual runway operations since October 2008 and 57 movements per hour since March 2009.

## Annual Examinations and Revalidations on ATCO Ratings

To ensure a high standard in ATC operations, the Training and Safety Section of the Division carried out annual practical examinations on ratings held by Air Traffic Control Officers (ATCO). A total of 157 practical examinations were conducted in the three control streams - Aerodrome, Approach and Area Control.

In addition, the Division also issued Assistant Controller Certificates, Meteorological Observer Certificates, Instructor Certificates, Search and Rescue Certificates to officers who have attained their respective qualifications.



## 招聘及培訓航空交通管制人員

### 招聘見習航空交通管制主任

為應付預期的交通增長及中長期的人事升遷需求，空管人員的招聘和培訓程式必須審慎管理。由於本地就業市場欠缺符合相關資歷的人才，一般而言，民航處會在本地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，再晉升為空管主任。申請人須經過三個甄選步驟——首先是才能測驗的筆試，接著是面試，最後在評估中心進行一系列深入的認知能力及性格評估測試。



空管人員在控制塔模擬器內接受訓練。  
*Air Traffic Control staff attending training in the Control Tower Simulator.*

見習航空交通管制主任由入職至可全面執行各項空管工作，須接受嚴格訓練，過程漫長。各階段的訓練單元需要周詳規劃，以令見習空管主任可達致表現進展基準。為符合簽發執照的條件，各訓練單元均會提供課堂理論講座，然後進行模擬器實習訓練，最後讓見習空管主任在導師的指導下，處理「實況」航空交通，直至通過所有評核考試為止。

為加深公眾和求職人士對空管行業的認識，民航處積極參與每年舉行的「教育及職業博覽」、在大學舉辦就業講座、並在年內定期安排學生參觀部門的空管設施。

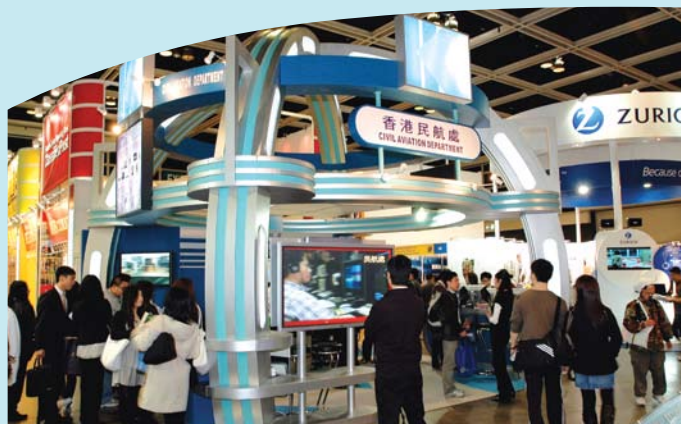
## RECRUITMENT AND TRAINING OF AIR TRAFFIC CONTROL STAFF

### Recruitment of Student Air Traffic Control Officer

The recruitment and training of ATC staff have to be carefully managed to meet anticipated traffic growth and medium to long term manpower succession needs. Qualified human resources are not readily available in the local job market, and ATCOs are normally recruited locally as Student Air Traffic Control Officers (SATCOs) to receive the specialised training. Candidates will go through the following screening steps – an initial written aptitude test and interview. The short listed candidates will attend the “Assessment Centre”, which is a series of in-depth assessment tests on cognitive ability and personality traits.

Student Air Traffic Controllers receive intensive training from entry until attaining full performance status. This is a lengthy process requiring carefully staged training modules to match the performance development benchmarks. To fulfil the licensing requirement, each module involves lectures in classrooms and then practice in the simulator before progressing to handling ‘live’ traffic under the guidance of an instructor until passing all validation check examinations.

With the objective of introducing the profession to the public and potential job applicants, CAD participated in the annual Education and Career Expo, held career talks in universities and conducted regular students visits to our ATC facilities throughout the year.



民航處積極參與每年舉辦的教育及職業博覽。  
*The Department participated in the annual Education and Careers Expo.*



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截至二零零九年三月三十一日，在職的空管主任及航空交通事務員分別為252人及102人。

### 空管培訓

職員培訓向來是本部的重點任務。年內，本部舉辦多項課程及在職訓練活動。除了已安排的內部空管培訓和有關飛機緊急事故的複訓課程外，本部與民航訓練中心合辦課程，以及為中國民用航空局(中國民航局)空中交通管理局人員舉辦技術交流計劃。

As of March 31, 2009, the strength of Air Traffic Control Officers and Air Traffic Flight Services Officer was 252 and 102 respectively.

### ATC Training

Staff development continued to be one of the major tasks for the Division. Courses of instruction and on-the-job training activities had been intensive all through the year. Apart from the programmed in-house ATC training and refresher courses on the handling of aircraft emergency situations, the Division also conducted courses in conjunction with the Civil Aviation Training Centre and offered attachment programme for Air Traffic Management Bureau officers of the Civil Aviation Administration of China (CAAC).



培訓一名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，通常大約需時五年。

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培訓一名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，通常大約需時五年。其間該名人員須取得多項不同範疇的空管資歷。此外，我們須為在職空管主任編排定期複訓，以確保他們一旦面對突發情況，如航機遇到惡劣天氣或其他緊急事故等，都能應付自如。年內，本處舉辦了25項專業範疇的空管培訓課程及兩項空管複訓課程，共有277名人員參加。受訓人員取得多項專業資格，及獲發44項空管執照。此外，九名見習空管主任接受基礎飛行訓練，14名參加海外航空交通管制課程，此類海外培訓活動可讓受訓人員增進航空知識，豐富有關空管運作的閱歷及有助在職發展。

年內，多名較資深的空管主任獲選接受進階搜救訓練，參與空管或飛機事故調查，以便承擔責任更重的職務。

### 其他培訓

本部與民航訓練中心合辦「航空交通管理概論」課程。這課程舉辦多年，深受歡迎，學員包括航空相關界別的從業員及對航空有興趣的市民。

年內，本部亦為中國民航局東北空中交通管理局六名空管督導主任舉辦一項技術交流計劃。

## 新航空交通管制程式

### L642及M771航路實施縮小縱向間隔標準

二零零八年七月，香港在L642及M771航路實施縮小縱向間隔標準。同一巡航高度層航機之間的間距，由80海里減至50海里。實施新的縮小縱向間隔標準，不但可提升航道容量，更可讓航機有更多機會在最適當的高度層巡航。新程式在安全有效的情況下順利實施。

Training of a SATCO to become a fully qualified controller at the rank of ATCO II normally takes around five years where the individual would have to acquire qualifications in various ATC disciplines. In addition, periodic refresher training has to be arranged for qualified ATCOs to ensure that their competency in responding to unusual circumstances, such as poor weather operations and aircraft emergencies is maintained as a good standard. During the year, a total of 25 ATC training courses on various disciplines of the profession and two refresher training courses were conducted for 277 officers, leading to the issue of 44 ATC ratings and the attainment of other professional qualifications. As part of their career development, nine SATCOs were provided with General Flying Progress Test (GFPT) flying training and 14 SATCOs attended overseas courses on air traffic control. These overseas training activities enhanced their aviation knowledge and broadened their exposure to ATC operations.

More senior ATCOs were selected in the year to attend advanced training on Search and Rescue, ATC Incident Investigation and Aircraft Accident Investigation in order to undertake duties at a higher level.

### Other Training Offered

The Division has in conjunction with the Civil Aviation Training Centre conducted a course on "Introduction to Air Traffic Management". The course is conducted regularly and has been well received by personnel engaged in the aviation-related industries and interested public.

The Division has also conducted an attachment programme in the year for six ATC supervisors from Northeast Air Traffic Management Bureau of CAAC.



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### 重置東面扇區的空中等候區

二零零九年三月，民航處按照二零零八年進行的空域及跑道飛機升降容量顧問研究的建議，把香港以東、用以應付航班延誤的空中等候區重置到較接近機場位置。採用新等候區後，空管人員可更有效地善用每個降落時段，藉此盡量提高抵港航班的著陸率。

### 安全管理系統

二零零八至二零零九年度，航空交通管理部繼續發展部內的安全管理系統。二零零八年四月，隨著航空交通工程及標準部的成立，本部根據航空導航服務機構的概念修訂了安全管理系統的適用範疇，以便同時涵蓋航空交通工程及標準部的安全管理。

年內，本部發出多份安全管理系統的重要文件，包括《航空導航服務手冊》和《航空導航服務安全管理系統手冊》。為加強安全水準，航空交通管理部亦發布安全通訊、經驗總結、運作提示等多份檔案，以及本地和外國航空安全期刊摘錄，提高前線人員的安全意識。

《航空導航服務安全管理系統手冊》載有國際民航組織國家安全綱領的重要元素，以符合該組織的安全管理系統的標準及建議守則。至於航空導航服務的安全目標，本部亦在二零零九年二月發布了空管服務安全表現指標和目標的可接受安全水準。

本部的持續安全管理措施，亦包括定期進行安全評估和調查。年內，本部進行了四次內部安全審計。

至於安全程式方面，本部制訂了「恢復正常運作計劃」，並自二零零九年二月起訂定「偏離預定軌道飛機和攔截民航飛機的程式」，以及「航空交通服務受重大干擾的應變計劃」。

### NEW AIR TRAFFIC CONTROL PROCEDURES

#### *Application of Reduced Longitudinal Separation Standard on Airways L642 and M771*

Hong Kong applied reduced longitudinal separation on Airways L642 and M771 in July 2008. The revised separation between aircraft at same cruising level has been reduced from 80NM to 50NM. With the new reduced longitudinal separation standard, the capacity of the air routes can be enhanced and the opportunities for flights to cruise at their optimum level have also been increased. Transition to the new procedures was conducted in a safe and efficient manner.

#### *Relocation of Airborne Holding Pattern in the East Sector*

As recommended by a Consultancy Study on Airspace and Runway Capacity in 2008, the holding pattern for absorbing airborne delays to the east of Hong Kong was relocated closer to Airport in March 2009. The new holding pattern position allows ATC to make the most effective use of each landing slot so as to maximise the arrival landing rate.

### SAFETY MANAGEMENT SYSTEM (SMS)

The ongoing development of SMS in ATMD was robust in 2008-09. The SMS framework in ATMD was modified to also cover the safety management aspects of the Air Traffic Engineering and Standards Division (AESD) under the air navigation services providers (ANSP) concept upon the establishment of the AESD in April 2008.

A number of important SMS documents, including the ANS Exposition and ANS Safety Management System Manual (SMSM) were issued during the report year. In promoting safety, ATMD had also promulgated a number of Safety Bulletins, Lessons Learnt, Operational Reminders and extracts from both local and foreign safety journals in order to raise the safety awareness of the frontline staff.



有關安全管理的培訓，本部在二零零九年一月訂定了有條理的安全管理系統培訓計劃。

### 國際民航組織搜索及救援(搜救)研討會及二零零八年香港搜救演習

二零零八年十月二十八至二十九日，香港民航處在國際民航組織的支持下，舉辦搜救研討會，並隨即在十月二十九至三十日舉行二零零八年搜救演習。

國際民航組織搜救研討會的目標，是協助參加者重新認識成員國在搜救方面的職責，以及向他們介紹最新的搜救技巧、措施和支援設施。研討會有124名來自13個國家的代表出席。本地方面，香港消防處、水警、海事處和政府飛行服務隊亦有相當數量的人員參加。

搜救演習定期舉行，旨在測試在香港飛行情報區進行搜救時所採取預警、協調和通訊程式的效率和成效。二零零八年搜救演習包括短程和長程搜救。



政府飛行服務隊派出的超級美洲豹型直升機示範從消防船的甲板上吊起一名模擬生還者。

A Eurocopter Super Puma helicopter from the Government Flying Service demonstrating the deck winching of a "survivor" from a fireboat.

The SMSM incorporates the important components and elements of the State Safety Programme (SSP), conforming to the ICAO SMS standards and recommended practices. In respect to Safety Objectives in the provision of air navigation services, an Acceptable Level of Safety (ALOS) in terms of Safety Performance Indicators and Safety Performance Targets were promulgated in February 2009.

As part of the on-going safety management initiatives, regular safety assessments and safety surveys were conducted; and a total of four internal audits were carried out during the report period.

In terms of safety procedures, the Normal Operations Resumption Plan was formulated; procedures for strayed aircraft and interception of civil aircraft, and a Contingency Plan for major disruption of ATS had also been put in place since February 2009.

With respect to safety management training, a structured SMS training programme was put in place in January 2009.

### ICAO SEARCH AND RESCUE (SAR) SEMINAR AND HONG KONG SAR EXERCISE (SAREX) 2008

Hong Kong CAD hosted a Search and Rescue Seminar on October 28 to 29, 2008 under the auspices of the International Civil Aviation Organization (ICAO). SAREX 2008 commenced right after the Seminar from October 29 to 30, 2008.

The objectives of the ICAO SAR Seminar were to help participants to refresh their awareness of the state's responsibilities on SAR and to update them of the latest development in SAR techniques, practices and supporting infrastructure. A total of 124 participants from 13 countries attended the Seminar. A considerable number of local participants from Fire Services Department (FSD), Hong Kong Marine Police, Marine Department and Government Flying Service (GFS) also attended.

SAR exercise is conducted regularly with a view to testing the effectiveness and efficiency of the alerting, co-ordination and





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二零零八年十月二十九日，短程搜救演習在南丫島東澳灣進行，參與的還有中國人民解放軍駐香港部隊、中國海事局、中國交通部、水警、香港消防處、民眾安全服務隊和政府飛行服務隊。

長程搜救演習利用政府飛行服務隊的直升機和定翼機、美國空軍和美國海岸巡邏隊的飛機和船隻，在香港以南約50海里進行搜救行動。兩項演習順利完成。

搜救研討會和二零零八年搜救演習為期三天，提供寶貴機會，讓不同國家的搜救專家討論搜救技巧，並互相觀摩，朝著救傷扶危的共同目標不斷努力。

### 珠江三角洲(珠三角)地區航空交通管理計劃

香港民航處、中國民航局與澳門民航局組成的三方工作組於年內舉行了兩次會議，檢討工作進展和商討珠三角地區空中交通流量管理的要求。工作組同意制訂離場流量綜合管理系統，以便更全面地管理珠三角主要機場的航機離場次序。預計新系統長遠能大幅減低珠三角地區整體的離場延誤。



珠三角空中交通管理規劃與實施專題工作組第五次會議  
二零零八年十二月在深圳舉行。

*The 5th meeting of the "PRD Air Traffic Management Planning and Implementation Supervisory Group" held in Shenzhen in December 2008.*

communication procedures for the provision of search and rescue services in the Hong Kong FIR. SAREX 2008 consisted of both short-range and long-range exercises.

The short range SAREX was conducted at Tung O Wan of Lamma Island on October 29, 2008, participated also by the People's Liberation Army of the Hong Kong Garrison, China Maritime Safety Administration, China Ministry of Communications, Hong Kong Marine Police, FSD, Civil Aid Service and GFS.

In the long-range exercise, GFS helicopters and fixed-wing aircraft, United States Air Force and United States Coast Guard aircraft and vessels were deployed to perform the SAR mission at approximately 50 NM south of Hong Kong. The search exercise was successfully concluded.

The three-day SAR Seminar and SAREX 2008 provided excellent opportunities for SAR experts from various countries to discuss SAR techniques and to share their experience with each other for the common goal of saving lives.

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

The Tripartite Working Group formed by the Hong Kong CAD, the Civil Aviation Administration of China and the Macao Civil Aviation Authority held two meetings within the year to review the work progress and discuss the requirements for air traffic flow management for the PRD region. The Group agreed to develop an integrated departure flow management system to manage the departure sequence of major PRD airports in a more holistic manner. It is envisaged that the new system can significantly reduce the overall departure delays within the PRD region in the long term.

### OVERSEAS ATC MEETINGS AND CONFERENCES

During the year, the Division continues to participating actively in overseas meetings and conferences on issues related to air traffic

## 海外空管會議和研討會

年內，本部繼續積極參與航空交通管理事務的海外會議和研討會，包括由國際民航組織、其他航空機關和民用航空導航服務組織主辦的會議和研討會。

## 電訊服務

關於固定航空通訊服務，航空通訊組年內處理的資訊達 29 578 450 個，較上一年度增加 5.1%。

航空氣象廣播服務方面，航空通訊組年內為航機提供合共 215 635 次氣象報告，較上一年度微增 1.5%。

management. These include meetings, seminars and conferences initiated by ICAO, other aviation authorities and the Civil Air Navigation Services Organisation (CANSO).

## TELECOMMUNICATIONS SERVICES

On Aeronautical Fixed Service, the number of messages handled by the Telecommunications Unit of the Division during the year reached a total of 29 578 450, representing a 5.1 per cent increase over last year.

On Aeronautical Broadcast Service, a total of 215 635 weather messages were provided to aircraft in flight during the year. The amount was slightly increased by 1.5 per cent as compared with the previous year.

