

FLIGHT STANDARDS AND AIRWORTHINESS

飛行標準及適航部的主要工作是監察航空營運許可證持有人是否遵守適航和營運的標準，及確保香港的標準符合國際水平。其他工作包括簽發航空人員執照、分析安全數據、簽發飛機登記、監察航空營運、輕型飛機及直升機事務，和調查航空意外及事件。

要執行上述的主要工作、飛行標準及適航部分別由航空營運督察組、適航事務組及航空人員執照事務處組成。

I. 航空營運督察組

在報告年度初期，本港共有六間持有香港航空營運許可證的公司，分別是：

國泰航空公司
港龍航空公司
香港華民航空公司
香港直升機服務公司
邁特捷出租飛機有限公司
香港聯合直升機有限公司

在報告年度內，本處並沒有收到新的航空營運許可證申請。本部的航空營運督察繼續定期巡查領有航空營運許可證公司的飛行、站務、航務人員訓練和它們的營運紀錄，年內共巡查了177次。本港航空公司年內所使用的飛行模擬器共有18台

The primary role of the Flight Standards and Airworthiness Division is to monitor compliance by holders of Air Operator Certificates (AOC) with established airworthiness and operational standards and to ensure the standards applied in Hong Kong reflect current international practices. Other functions of the Division include personnel licensing, safety data analysis, maintenance of the aircraft register, supervision of airline flight operations as well as light aircraft and helicopter operations and the investigation of aircraft incidents and accidents.

In order to discharge these functions, the Flight Standards and Airworthiness Division is divided into the Flight Operations Inspectorate, the Airworthiness Office and the Personnel Licensing Office.

I. FLIGHT OPERATIONS INSPECTORATE

There were six holders of Hong Kong AOC at the beginning of the report period, namely:

Cathay Pacific Airways Limited (CPA)
Hong Kong Dragon Airlines Limited (Dragonair) (HDA)
AHK Air Hong Kong Limited (AHK)
Heliservices (Hong Kong) Limited
Metrojet Limited
Helicopters Hong Kong Limited (HHKL)

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(10 台設於啟德機場，另八台設於海外)。原有的 15 台通過評審後再次獲得認可使用；此外，三台新的飛行模擬器（兩台位於北京的空中巴士及一台位於美國華盛頓的 BAe 4100）經評審後亦獲批准分別為港龍航空公司及政府飛行服務隊所使用。與此同時，營運督察亦監察政府飛行服務隊的直升機和定翼機的運作。

為確保外國航空公司於香港國際機場的運作符合國際標準，營運督察在無預先通知的情況下巡查停在停機坪的飛機。本部在年內共完成了三次此類巡查。

航空營運督察亦參與數項重要的飛機營運發展。國泰航空公司旗下的波音 B747-200 型號飛機已全部退役，並由新增設的空中巴士客機所取代。該公司亦成功地將波音 B777-300 型號客機引入其機隊，並使用於太平洋地區的航線上。本處更批准國泰的波音 B777-200 及 300 型號客機的雙發動機延續運作認可證的營運規則，使其營運航線與適合起飛降落的機場的相距航程增加至 180 分鐘。政府飛行服務隊亦以較大及更先進的 BAe4100 型號飛機取代空中霸王 (KingAir) 型號的渦輪螺旋槳雙發動機定翼飛機。在進行搜索拯救行動時，BAe4100 型號較空中霸王型號飛機可作更長時間的搜救飛行。

There were no applications for new AOC during the report period.

The Flight Operations Inspectorate continued to monitor the activities of local AOC holders through a varied programme of in-flight, station, training and operational record inspections, which totalled 177 in the year. Of the 18 flight simulators used by the local airlines (10 at Kai Tak and eight overseas), 15 were evaluated and re-approved for use. In addition, two new Airbus simulators at Beijing and a BAe4100 simulator at Washington were approved for use by Dragonair and the Government Flying Service (GFS) respectively. The helicopter and fixed-wing aircraft operations of GFS were also monitored.

To ensure compliance with international standards amongst foreign airlines using HKIA, ramp inspections were also conducted on an ad-hoc basis. Three such inspections were completed during the report period.

Flight Operations Inspectors were involved in several significant operational developments during the year. CPAs B747-200 aircraft were phased out of service and replaced by additional Airbus aircraft. The B777-300 variant was successfully introduced in CPAs regional operations, while both the -200 and -300 variants of this twin-engine type were granted approval to operate up to 180 minutes from the



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在直升機營運方面，香港直升機服務公司因抵觸飛行紀律，本處曾暫停其營運許可證一段短時間（兩星期）。期間，香港直升機服務公司對其內部管理架構及主要人事作出必須的改變，該公司的營運現已回復正常。亞太直升機有限公司接管香港聯合直升機有限公司，兩間公司管理層的合併亦意味着在未來營運上會有若干合併。香港聯合直升機公司亦為早日引入S76型號直升機作出相當多的準備工作。

針對超長途飛行運作而修訂的飛行工作時間限制規條於一九九八年八月公布後，受到世界各地廣泛的注意。營運督察已正式批准個別營運許可證持有公司就新修訂的飛行工作時間限制規條而提交的方案，獲批准的方案已成功地在業內實施。

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航空人員執照事務處

執照事務處年內共處理了1 184份首次簽發、更新、批核和延續執照申請，並且簽發了2 816張健康合格證書，及評核了1 582份飛行員執照及飛機維修工程師執照考試試卷。

香港大部分專業飛行員都是以外地執照換領香港執照。執照事務處年內共接到

nearest suitable airport under Extended Range Twin Operations (ETOPS) rules. GFS phased out its two KingAir light twin turbo-prop fixed-wing aircraft, and replaced them with the larger and more sophisticated Jet Stream BAe4100, which allows longer time-on-task in search and rescue operations.

In the helicopter field, the AOC of Heliservices was suspended for a short (two-week) period due to breaches of flying discipline; the operator made necessary changes to its management structure and key personnel therein, and is now operating satisfactorily. HHKL was taken over by East Asia Airlines, with some consequential integration of management structure of the two organisations. This will also result in some integration of future operations, and the early introduction of the Sikorsky S76 type by HHKL for which considerable preparatory work has been undertaken.

New Flight Time Limitations (FTL) requirements, with particular emphasis on ultra-long-range operations, were published in August 1998, and received considerable publicity worldwide. The Inspectorate formally approved individual FTL schemes produced by the local operators in accordance with the new requirements, which have now been successfully implemented.

Personnel Licensing Office

During the year, the Personnel Licensing Office handled 1 184 applications for initial issue, renewal, endorsement and extension of licences; issued 2 816 medical certificates and set 1 582 examination papers for applicants of flight crew licences and aircraft maintenance engineer licences.

Most of Hong Kong's professional flight crew licences are issued by conversion from foreign licences. This year 173 applications from foreign licence holders were processed. The Performance Type examinations were introduced with effect from January 1, 1999. Flight crew licence holders seeking



173 個外地執照持有人換領香港執照的申請。執照事務處由一九九九年一月一日開始為飛行員舉辦飛機性能型別考試，已持有執照的飛行員在申請認可在另一型別飛機上作多機組人員運作前，必須通過該型別飛機的性能考試。

國泰航空公司獲本處批准自行舉辦 B777 型飛機等級換型的訓練課程及認可其學員的考試成績。該公司已獲批准的訓練課程考試包括 A330, A340, B747-400 及 B777 型飛機等級，本處則透過定期巡查監察其考試。年內有 173 名機員成功完成該等課程及考試，並獲執照事務處簽發有關的飛行執照。

II. 適航事務組

適航事務組繼續監管香港登記飛機的適航及維修水平。本處曾派員在本港和到國內和海外的飛行中途站及認可維修機構進行定期審查。在簽發或更新飛機適航證前，適航事務組亦分別在西雅圖、杜魯茲及香港進行了多次審查。

本年度適航事務組增聘了兩名本地適航標準主任，使該組人員達至 13 人。該兩名新入職的適航標準主任將接受由英國民航局主辦的適航審查員課程。本處亦繼續積極提供培訓予在職適航標準主任，訓練包括航空意外調查、私人飛機飛行員執照及人為因素課程等。

公司許可審定

適航事務組年內定期審查太古(廈門)飛機工程公司。該公司的第二機庫建造工程正在進行中，建成後可提供額外兩個飛機維修艙，工程將於一九九九年四月底完成，屆時將由六個民用航空機構作出聯合審查。這六個機構分別是中國民用航空總局、香港民航處、英國民航局、美國聯邦航空局、新加坡航空局及日本航空局。

the endorsement of aircraft types certified for multi-crew operations are required to complete the examinations specific to the aircraft types.

CPA was granted approval to conduct in-house type rating conversion courses and examinations for the issue of aircraft ratings on the B777 aircraft. The company's in-house examination approvals now cover A330, A340, B747-400 and B777 aircraft. Through regular inspections, the Department monitored these examinations. During this year a total of 173 aircrew had completed the in-house courses and examinations and were endorsed with the appropriate aircraft rating on their licences by the Personnel Licensing Office.

II. AIRWORTHINESS SECTION

The Airworthiness Office continued to monitor the maintenance and airworthiness standards of all Hong Kong registered aircraft. Routine AOC line station audits and approved maintenance organisation audits were carried out in Hong Kong, the Mainland and overseas, while aircraft were surveyed for the issue and renewal of Certificate of Airworthiness in Seattle, Toulouse and Hong Kong.

Two additional local Airworthiness Standards Officers were recruited this year, thus strengthening the workforce to 13 officers. The two new officers will receive Surveyor Training Programme organised by the United Kingdom Civil Aviation Authority. Training on other officers continued which included Aircraft Accident Investigation, Private Pilot Licence and Human Factors courses.

Company Approvals

Taikoo Aircraft Engineering Company Limited (TAECO) at Xiamen Airport was visited regularly during the year. The construction of the second hangar was underway and would provide two additional maintenance bays upon completion. A joint audit would be carried out by six aviation

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中國飛機服務有限公司及泛亞太平洋航空服務有限公司已於一九九八年七月取得由本處發出的維修許可證，並且隨着位於赤鱸角的新機場啟用而正式提供外場維修服務。



飛機維修公司搬遷

一九九八年七月，香港飛機工程有限公司分階段順利把機械和儀器搬遷至赤鱸角及將軍澳新址。赤鱸角的新設施包括一座擁有五個維修艙的飛機庫及位於新機場的外場維修部。將軍澳的新設施則包括航空電子及部件翻修工場。

香港發動機服務公司搬遷至將軍澳的工作於一九九八年十月順利完成，新設施包括一所大型發動機試車間，可為推動力大至13萬磅的發動機作測試。

政府飛行服務隊於一九九八年六月完成其搬遷往赤鱸角新總部的工作，並於六月二十三日開始在新機場運作。

在搬遷期間及前後，適航標準主任均作出經常性審查，以確保新設施符合法定要求。

authorities for the check-out of the second hangar at end of April 1999. These six aviation authorities were the General Administration of Civil Aviation of China, Hong Kong Civil Aviation Department, United Kingdom Civil Aviation Authority, United States of America Federal Aviation Administration, Civil Aviation Authority of Singapore and Japan Civil Aviation Bureau.

China Aircraft Services Limited (CASL) and Pan Asia Pacific Aviation Services Limited (PAPAS) were granted Approvals in July 1998 and started their line maintenance operations with the opening of the new airport at Chek Lap Kok.

Relocation of Aircraft Maintenance Companies

The relocation of the machinery and equipment of Hong Kong Aircraft Engineering Company (HAECO) was successfully carried out in phases in July 1998. After relocation, the facilities of HAECO split into two locations, namely, the five-bay hangar and line maintenance at HKIA at Chek Lap Kok and the Avionics and Component Overhaul Workshop at Tseung Kwan O.

Hong Kong Aero Engine Services Limited (HAESL) completed its relocation to the Tseung Kwan O facilities in October 1998. The new facilities included a large engine test house capable of testing engines up to 130 000 pounds thrust.

GFS completed its relocation to the new HKIA headquarters in June 1998 and commenced operation on June 23, 1998.

During the relocation of these organisations, Airworthiness Standards Officers carried out regular audits on the new facilities to ensure compliance with statutory requirements.



飛機維修工程師執照

由於有新公司的成立及人手增加的關係，飛機維修工程師執照的申請大幅增加了30%。

飛機登記

年內共有17架新民用飛機在香港登記，分別為四架空中巴士A320型、兩架空中巴士A330型、三架空中巴士A340型、五架最新的波音B777-300型客機、一架S76C+型直升機和政府飛行服務隊兩架BAe4100型飛機。同期亦有四架波音B747-200型、四架空中巴士A320型、兩架空中霸王B200C型飛機和一架曉士MD500型直升機取消登記。截至一九九九年三月三十一日，在香港登記的民用飛機共有115架。

Aircraft Maintenance Engineers Licensing

Due to the establishment of new companies and recruitment of new employees, the total number of applications for Aircraft Maintenance Engineer Licence increased significantly by 30 per cent.



Aircraft Register

During the year, a total of 17 new aircraft was put on the Hong Kong Civil Aircraft Register. These included four Airbus 320, two Airbus 330, three Airbus 340 and the introduction of five Boeing 777-300 airliners, as well as a Sikorsky S76C+ helicopter. GFS also received delivery of two Jet Stream BAe4100 aircraft. In the same period, four Boeing 747-200, four Airbus 320, two KingAir B200C and one Hughes MD500 helicopter were removed from the register. As at March 31, 1999, the total number of civil aircraft registered in Hong Kong was 115.

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香港登記的飛機類型
(至一九九九年三月三十一日)：

型號	數量
空中巴士 A320	7
空中巴士 A330	18
空中巴士 A340	11
波音 B747	37
波音 B777	9
HS125	1
BAe4100	2
各類直升機	18
其他定翼飛機	12
合計	共 115 架

Composition of aircraft on the Hong Kong Civil Aircraft Register (as at March 31, 1999):

Aircraft Type	Number
Airbus A320	7
Airbus A330	18
Airbus A340	11
Boeing B747	37
Boeing B777	9
HS125	1
BAe4100	2
Helicopters	18
Other fixed-wing	12
Total	115

Airworthiness Office statistics:

	Number
Certificate of Airworthiness Issued	15
Certificate of Airworthiness Renewed	106
Major Modification Approved (AANs)	38
Additional Companies Approved	4
Engineering Written Examinations Conducted	292
Flight Crew Technical Written Examinations Conducted	373
Oral Examinations Conducted	180
Authorisation and Variations Issued	53

適航事務組統計數字：

	數量
簽發適航證	15
更新適航證	106
重大改裝審定	38
新增單位審定	4
工程師執照筆試	292
機組人員執照技術筆試	373
工程師執照口試	180
簽發委任證和變更許可證	53



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III. 輕型飛機運作

本部繼續密切監察香港飛行總會及私人的輕型飛機和直升機活動，亦舉行定期會議協調使用者在本地空域的活動。自啟德機場關閉後，石崗是本地唯一可提供作輕型飛機運作的機場，為此，解放軍駐港部隊批准香港飛行總會在周末繼續於石崗機場進行飛行活動和訓練。如有需要，他們也會提供飛機庫的地方給香港飛行總會作飛機維修用途。

IV. 意外和事件調查

飛行標準及適航部的主管亦是副意外調查總督察。當有飛機在香港發生意外，或在本港登記的飛機在外地發生意外，民航處會從飛行標準及適航部、機場安全標準部和航空交通管理部抽調人手成立調查小組。本年度共調查了三宗主要的航空事件，詳見下文。

III. LIGHT AIRCRAFT OPERATIONS

The light aircraft activities of the Hong Kong Aviation Club (HKAC) and other private owners including helicopters continued to be closely monitored. Meetings were held at regular intervals to co-ordinate activities of local airspace users. After the closure of Kai Tak, Sek Kong is the only airfield available for light aircraft operations. In that respect, the Hong Kong Garrison of the People's Liberation Army allowed HKAC to continue their recreational flying and training at Sek Kong Airfield during weekends. Hanger space was also made available to HKAC for aircraft maintenance if required.

IV. AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION

The head of the Flight Standards and Airworthiness Division is the Deputy Chief Inspector of Accidents. When an accident occurs in Hong Kong or to a Hong Kong registered aircraft outside Hong Kong,

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一九九八年十月九日，民航處就一架登記為VR-HVY的波音B747-236F型貨機在一九九六年十二月五日所發生的事件發表調查報告。事件中，飛機一號發動機吊架的扭力隔板損壞，有一道裂紋橫跨整段隔板。調查確定事件成因是由於飛行周期頻密，導致兩條垂直翼弦出現勞損，建議波音公司應在其補充結構檢驗文件D6-35022加入檢查所有發動機類別的吊架結構。

有關登記為VR-HOS的波音B747-400型號飛機於一九九七年六月七日發生事件的調查已完成。肇事飛機部分前段襟翼在啟德機場進場途中脫落。飛機右邊內段後緣襟翼的前端脫落，原因是其內段程序滑動架安裝接頭斷裂，腐蝕處產生了局部集中的壓力，引發裂紋，其後更變成疲勞裂紋，導致接頭的塑性斷口。調查報告的安全建議部分強調，航空公司應嚴格遵行波音公司在有關方面的建議守則。

一九九八年八月十七日，一架登記為B-HJK的AS-355N型號雙發動機直升機在香港東北面的西貢郊野公園內編號蚬蛇尖23(SP23)的直升機降落場發生了一宗著陸事

Inspectors of Accidents are drawn from the Flight Standards and Airworthiness Division, the Airport Standards Division and the Air Traffic Management Division to form an investigation team. During the year three major aircraft incidents were investigated and are described below.

On October 9, 1998, the Hong Kong Civil Aviation Department published the report of the investigation into an incident involving a Boeing B747-236F freighter bearing registration VR-HVY on December 5, 1996. The torque bulkhead at the rear of the aircraft's No. 1 engine pylon was found to have suffered from a failure in the form of a crack that extended across the full width of the bulkhead. The investigation determined that the cause of the incident was the fatigue failure of both vertical chords resulting from a high number of flight cycles. It was recommended that Boeing should expand the Supplement Structural Inspection Document D6-35022 to include the pylon structure for all engine types.

Investigation on the loss of a partial foreflap during an approach to Kai Tak Airport on June 7, 1997 by a B747-400 aircraft, registration VR-HOS,





件。當時肇事直升機正為一名該公司新聘請的機師進行飛機等級換型訓練，而作模擬單發動機降落。在直升機接近地面的一刻，因快速下降及猛力着地而導致尾槳、尾槳減速器及下垂直尾翼導致相當程度的損毀，但機師未有受傷。意外調查總督察下令作出有關調查以確定事故成因，結果顯示該次事故的成因在於操縱機師在進場過程中判斷失誤，以致直升機的尾部撞及地面，而機長亦未能就情況作出適當的修正。調查小組更指出局部風向轉變可能令肇事情形更惡劣。調查報告提出了三項安全建議，其中包括直升機操作場地必須具備應有的安全設備，另直升機公司的操作及訓練手冊必須提供更清晰的飛機等級換型改裝訓練指引。

安全數據分析

飛行標準及適航部與航空公司及維修公司保持緊密聯絡，研究有關在香港登記飛機發生的事件，本年度共調查和分析了284宗。

was completed. The detachment of a portion of the right hand inboard trailing edge foreflap portion was caused by the failure of its inboard sequence carriage attachment fitting. Corrosion pits in the area resulted in local stress concentration that developed into cracks, leading to fatigue cracking and ductile fracture of the fitting. The safety recommendation made in the report emphasised that operators should strictly comply with Boeing's recommendations on the subject area.

On August 17, 1998 a twin engine AS-355N helicopter, registration B-HJK, was involved in a landing incident near the helipad Sharp Peak 23 (SP23) in the northeastern part of Hong Kong, within the Sai Kung Country Park. The flight was intended to carry out conversion training for a pilot recently employed by the company. At the time of the incident a simulated single engine landing was being carried out. As the helicopter approached the ground, it sank rapidly and hit the ground heavily resulting in considerable damage to the tail rotor, the tail rotor gearbox, and the lower tail fin. The pilots were not injured. The Chief Inspector ordered an investigation into the incident to determine its causes. The cause was found to be a misjudgment by the handling pilot during the approach, which allowed the tail of the aircraft to strike the ground and the commander failed to correct the situation in time. It was probably exacerbated by a localised change in the wind. The report made three safety recommendations covering safety equipment to be available at such sites and clearer instructions for such conversions to be put in the company Operations Manual and Training Manual.

Safety Data Analysis

The Division maintained close liaison with airline operators and maintenance organisations regarding occurrences involving Hong Kong registered aircraft. During the year, 284 occurrences were investigated and analysed.

第五章 CHAPTER 5