CHAPTER 2

Government Flying Service

Operation of the Government Flying Service

Audit Commission
Hong Kong
1 April 2015

This audit review was carried out under a set of guidelines tabled in the Provisional Legislative Council by the Chairman of the Public Accounts Committee on 11 February 1998. The guidelines were agreed between the Public Accounts Committee and the Director of Audit and accepted by the Government of the Hong Kong Special Administrative Region.

Report No. 64 of the Director of Audit contains 8 Chapters which are available on our website at http://www.aud.gov.hk

Audit Commission
26th floor, Immigration Tower
7 Gloucester Road
Wan Chai
Hong Kong

Tel : (852) 2829 4210
Fax : (852) 2824 2087
E-mail : enquiry@aud.gov.hk

OPERATION OF THE GOVERNMENT FLYING SERVICE

Contents

OPERATION OF THE GOVERNMENT FLYING SERVICE

Executive Summary

1. The Government Flying Service (GFS) was established under the GFS Ordinance (Cap. 322) in 1993 to provide flying services to the Government and those in need, including air ambulance service, search and rescue, fire fighting, aerial surveys and law enforcement. The GFS is committed to providing its round-the-clock flying services in a safe, efficient and cost-effective manner. As at 31 December 2014, the GFS had a strength of 218 staff and a fleet of 11 aircraft comprising nine operational aircraft and two training aircraft. From 2010 to 2014, the flying services in terms of flying hours provided by the GFS increased by 18% from 3,253 hours to 3,833 hours. The Audit Commission (Audit) has recently conducted a review of the operation of the GFS with a view to identifying room for improvement.

Provision of flying services

2. ***Performance targets.*** The GFS has set 23 performance targets in its Controlling Officer's Report (COR) for four types of operations (i.e. air ambulance service, search and rescue, law enforcement and fire-fighting operations) for measuring the percentage of the call-out cases in a year with the responding aircraft arriving on scene within the pledged times. The GFS reported in its CORs that on average, six (26%) of the 23 on-scene time targets were not met each year from 2010 to 2014. Over the same period, the GFS responded to 11,175 call-outs relating to the 23 on-scene time targets, of which 902 call-outs (8%) could not meet the respective pledged on-scene times. Of the 902 out-of-pledge cases, 59% were caused by weather limitations/air traffic control delay and 22% were due to unserviceable aircraft/unavailable aircrew. Audit found that the GFS's reported figures had not taken into account 609 multiple call-outs of which 550 were out-of-pledge cases. In addition, 311 out-of-pledge cases were incorrectly reported as on time cases. After making adjustments for these cases, the average number of on-scene time targets not met each year for the five years from 2010 to 2014 was 9.8 instead of six as reported by the GFS in the CORs (paras. 2.3 to 2.7, 2.10 and 2.12).

3. ***Response rates for service requests.*** Upon receiving a request for flying services, the GFS will arrange aircraft and aircrew with due consideration given to the urgency, weather conditions, availability of air assets and tasking priority. From 2010 to 2014, the GFS declined a total of 852 service requests after examining all relevant factors. The GFS had not duly taken into account these declined cases when reporting its response rates to flying services in the CORs (paras. 2.16 and 2.17).

4. ***Other management issues.*** Audit found that there was room for improvement in the GFS's management review of the flying services, particularly the out-of-pledge cases in providing emergency services and declined cases due to resource limitations. For the provision of familiarisation flight service for bureaux/departments, there is a need to enhance transparency and public accountability (paras. 2.22 to 2.24).

Management of aircrew members

5. ***Manning for 24-hour flying services.*** The GFS has to roster its aircrew to work in three shifts on a daily basis in order to provide emergency response on a 24-hour basis year-round. The GFS has laid down guidelines on the minimum crew requirements for each shift to meet the primary emergency response in addition to other planned tasking commitments. Audit found that of the 4,142 shifts arranged in 2013 and 2014, 178 (4.3%) were insufficiently manned. As a result, some emergency call-out cases were delayed or declined (paras. 3.2 and 3.4 to 3.6).

6. ***Aircrew duty and rest hours.*** To ensure safety and health in flight operations, the GFS has set the maximum flying/duty hours and minimum rest hours for its aircrew. Any extension of flying/duty hours of the aircrew or reduction of their rest time is recorded in a Commander Discretion Report (CDR) and a target number of CDRs is set each year to serve as a safety performance indicator. For three of the five years from 2010 to 2014, there were more CDRs than targeted (paras. 3.11 and 3.12).

Maintenance of aircraft

7. ***Aircraft availability target.*** For management reporting purpose, the GFS's Engineering Section is committed to making available a minimum of five of the nine operational aircraft from 7:30 to 23:00 and four operational aircraft from 23:01 to 7:29 for 95% of the time for each month. From 2010 to 2014, there were shortfalls on aircraft availability against the target in 33 (55%) months mainly due to major repairs and inspections. The failure to meet the aircraft availability target during the long maintenance period was a cause for concern as the provision of emergency services could be affected (paras. 4.3 to 4.6).

8. ***Aircraft downtime.*** From 2010 to 2014, the downtime of the nine operational aircraft totalled 78,961 hours, of which 26% were due to unscheduled maintenance. Unscheduled maintenance is disruptive to day-to-day operations and maintenance planning. The increasing trend in unscheduled maintenance (from 3,799 hours in 2010 to 4,539 hours in 2014) warrants the management's attention. Over the same period, there were a total of 2,895 aircraft defects reported by pilots before take-off for flying duties or after airborne. Besides rectifying the reported defects, the Engineering Section reviewed some of the defect cases for identifying room for improvement in the future maintenance work. The GFS needs to continue its effort in this regard and extend the scope of the review to cover all out-of-pledge cases (paras. 4.7, 4.8, 4.10 and 4.12).

Procurement of aircraft and spare parts

9. ***Payment issues and low utilisation of training aircraft.*** The GFS procured two training aircraft at a total cost of $11.06 million in 2008 and 2012. Audit found that the 5% payment discount ($181,000) provided for in one of the procurement contracts was not obtained. Moreover, advance payments for spare parts totalling $550,760 were written off after the overseas contractor's bankruptcy. Audit noted that the utilisation of the training aircraft was low. According to the GFS, the utilisation of the two training aircraft was lower than expected due to the reduced number of target trainees and resignation of some trainers. Even though the two aircraft had low flying hours, both aircraft had experienced long downtime due to maintenance-related issues (paras. 5.2, 5.3, 5.5, 5.7 and 5.10 to 5.13).

10. ***Delays in delivery of fixed-wing aircraft.*** In June 2009, the GFS obtained the Finance Committee (FC)'s funding approval of $776 million to replace the two fixed-wing aircraft. Due to technical problems encountered in the flight tests, the expected delivery date of the first aircraft would be late 2015 (i.e. 33 months later than the target commissioning date of March 2013 as stated in the FC paper). As a result, the expected benefits of the new aircraft to enhance the GFS's operational efficiency and flight safety could not be realised in the interim. Meanwhile, there were difficulties in maintaining the serviceability of the existing ageing fixed-wing aircraft and their mission equipment (paras. 5.19 and 5.22 to 5.24).

11. ***Replacement of existing helicopters by a single-model fleet.*** In June 2013, the GFS obtained the FC's funding approval of $2,187.5 million to replace the existing seven helicopters by a single-model fleet. The FC was informed that one of the existing helicopters would be used as backup for about four to five years after the new fleet was commissioned. Given that these existing helicopters would reach the end of their service lifespan after 2017 and there were occasions of suspension of these helicopters from services due to engineering problems, the GFS needs to review the adequacy of the contingency plan for the new single-model helicopter fleet (paras. 5.31 and 5.32).

Recent development

12. In November 2014, the GFS obtained funding from the Security Bureau for 2015-16 to commission a consultancy study on how well and sustainable the GFS's manpower and structure could support its mission, objectives and needs in the short, medium and long terms (para. 6.7).

Audit recommendations

13. **Audit recommendations are made in the respective sections of this Audit Report. Only the key ones are highlighted in this Executive Summary. Audit has *recommended* that the Controller, GFS should:**

Provision of flying services

(a) **improve accuracy and efficiency in the reporting of performance information in the CORs including multiple call-out cases and response rates for service requests (paras. 2.13 and 2.18(a));**

(b) **strengthen the monthly management review of the performance of the GFS flying services by placing more emphasis on the exceptional cases such as those relating to long time taken/failure in providing top priority emergency services (para. 2.28(b));**

Management of aircrew members

(c) **make greater effort to maintain sufficient crew for each shift of flying duties to provide a reliable primary emergency response (para. 3.13(a));**

Maintenance of aircraft

(d) **continue to review the maintenance planning and endeavour to synchronise as far as possible major repairs and inspections with a view to increasing the availability of serviceable aircraft (para. 4.18(a));**

Procurement of aircraft and spare parts

(e) **tighten internal control to ensure that the Standing Accounting Instructions requirements on payment control are always complied with (para. 5.15(a));**

(f) **review the downtime of the two training aircraft with a view to identifying effective ways to improve their serviceability (para. 5.15(c));**

(g) **closely monitor the outstanding contract work for the supply of the two new fixed-wing aircraft to ensure that greatest efforts are being made to expedite delivery of the aircraft (para. 5.27(a)); and**

(h) **review the adequacy of the contingency plan for the new single-model helicopter fleet in the event of manufacturing defects or reported failure and make refinement where appropriate (para. 5.33).**

Response from the Government

14. The Government generally agrees with the audit recommendations.

PART 1: INTRODUCTION

1.1 This PART describes the background to the audit and outlines the audit objectives and scope.

Background

1.2 The Government Flying Service (GFS) was established under the GFS Ordinance (Cap. 322) in 1993 to take over the functions of the then Royal Hong Kong Auxiliary Air Force. Its statutory functions include providing flying services for medical, search and rescue, and casualty evacuation purposes, fire fighting, aerial surveys, supporting law enforcement agencies in carrying out their law enforcement duties, and carrying passengers as authorised by the Secretary for Security. The GFS is committed to providing a safe, efficient and cost-effective round-the-clock flying service to the Government (to support the work of various bureaux/departments (B/Ds)) and those in need. The GFS's search and rescue operations cover both the Hong Kong Flight Information Region and Hong Kong Maritime Rescue Co-ordination Centre area of responsibility, i.e. extending up to 1,300 kilometres (km) south of Hong Kong.

1.3 ***Organisation.*** The GFS is headed by the Controller who reports directly to the Secretary for Security. The Controller is supported by five sections, namely the Operations Section, Training and Standards Section, Engineering Section, Quality and Flight Safety Section, and Administration Section. As at 31 December 2014, the GFS had a strength of 218 staff comprising the Controller, 37 pilots, 31 air crewman officers, 25 aircraft engineers, 71 aircraft technicians and 53 support staff. In addition, the GFS employed 12 staff of various posts on non-civil service terms. The GFS also appointed 77 auxiliary members (Note 1).

Note 1: *The auxiliary members are mainly specially trained doctors and nurses. They volunteer their services to provide specialist trauma and emergency treatment to the patients on board the aircraft from Friday to Monday and on public holidays. For air ambulance service, the Hospital Authority will deploy a staff to accompany the patient if needed. The estimated pay and allowances for the auxiliary services totalled $0.65 million for 2014-15.*

Introduction

For 2014-15, the estimated expenditure of the GFS was $367.3 million (Note 2). According to the Memorandum of Understanding between the Security Bureau and the then Economic Services Bureau (the policy bureau of the Civil Aviation Department (CAD) — Note 3) in 1995, the GFS is required to:

(a) ensure that its aircraft are operated in accordance with the Air Navigation (Hong Kong) Order 1995 (Cap. 448C) as if flying for the purposes of public transport;

(b) comply with the requirements of the Air Operator's Certificates Requirements Document issued by the CAD; and

(c) agree acceptable means of compliance with the provisions and requirements with the CAD.

To assure that the GFS's operations comply with the requirements, the CAD carries out inspections and audits of the GFS activities. The GFS also engages overseas military organisations to conduct periodic audits of its operations such as search and rescue. According to the GFS, such engagements are to ensure that its more complex missions meet high level of safety and professional standards.

1.4 ***GFS aircraft fleet.*** As at 31 December 2014, the GFS had a fleet of 11 aircraft comprising four fixed-wing aircraft and seven helicopters (see Table 1 for details).

Note 2: *The estimated expenditure comprised staff cost ($132 million), departmental expenses ($96.6 million), equipment and component overhaul ($131.2 million), and the estimated cash flow requirements of two capital projects for the replacement of aircraft during the year (totalling about $7.5 million — see para. 1.6).*

Note 3: *The policy responsibilities for civil aviation are now taken over by the Transport and Housing Bureau.*

Table 1

GFS fleet
(31 December 2014)

Aircraft	Number	Year commissioned	Main tasks
Helicopter			
Eurocopter Super Puma AS332 L2 (Super Puma) 	3	2001 and 2002	– Inshore and offshore search and rescue – Air ambulance service – Law enforcement – Fire fighting – Transportation of personnel and equipment
Eurocopter EC155 B1 (EC155) 	4	2002	– Inshore search and rescue – Air ambulance service – Law enforcement – Transportation of personnel and equipment – Aerial survey and photography

Table 1 (Cont'd)

Aircraft	Number	Year commissioned	Main tasks
Fixed-wing aircraft			
Jetstream 41 (J-41) 	2	1999	– Long-range search and rescue – Law enforcement – Aerial survey and photography
Zlin Z242L (Zlin) 	1	2009	– Training
Diamond DA42 (Diamond) 	1	2013	– Training
Total	11		

Source: GFS records

1.5 ***Flying services provided by GFS.*** From 2010 to 2014, the overall flying services in terms of flying hours provided by the GFS increased from 3,253 hours by 18% to 3,833 hours (see Table 2). All services reported increases ranging from 9% to 65%.

Table 2

Flying services provided by the GFS
(2010 to 2014)

Flying service	2010	2011	2012	2013	2014	Percentage of increase between 2010 and 2014
	(Flying hour)					
Air ambulance service	1,010	1,100	1,236	1,317	1,270	26%
Search and rescue	574	488	592	567	687	20%
Law enforcement	178	232	185	210	211	19%
Fire fighting	77	212	94	130	127	65%
Other services for B/Ds (Note)	1,414	1,586	1,537	1,580	1,538	9%
Overall	3,253	3,618	3,644	3,804	3,833	18%

Source: *GFS records*

Note: *Examples of other flying services for B/Ds are aerial surveys, passenger transfer and oil pollution surveillance.*

Remarks: *Besides providing flying services, the GFS also uses its aircraft for aircrew training/examinations (see para. 2.2). The number of flying hours for such purposes totalled 2,657 hours in 2014.*

1.6 ***Aircraft replacement exercises.*** In June 2009, the GFS obtained funding of $776 million (Note 4) from the Legislative Council Finance Committee (FC) to replace the two fixed-wing aircraft (J-41) which were approaching the end of their serviceable life. After the award of procurement contract in August 2011, the new aircraft had undergone a period of construction, special installation and testing. As at February 2015, some tests of the aircraft and mission equipment had yet to be completed. The first of such aircraft was expected to be delivered in late 2015. In June 2013, the GFS also obtained the FC's approval of $2,187.5 million (Note 5) to replace the seven helicopters which would reach the end of their service lifespan after 2017. As at February 2015, tender evaluation of the helicopter replacement project was in progress.

Audit review

1.7 In October 2014, the Audit Commission (Audit) commenced a review of the operation of the GFS with a view to identifying room for improvement. The review focused on the following areas:

(a) provision of flying services (PART 2);

(b) management of aircrew members (PART 3);

(c) maintenance of aircraft (PART 4);

(d) procurement of aircraft and spare parts (PART 5); and

(e) way forward (PART 6).

Note 4: *The approved funding comprised capital cost of aircraft ($266 million), and cost of mission equipment and modification work for the installation of the equipment ($358 million), spare parts and tools ($43 million), training for aircrew and engineering staff ($8 million) and contingency ($101 million).*

Note 5: *The approved funding comprised capital cost of aircraft ($1,456 million), and cost of mission equipment and modification work ($494.8 million), spare parts and tools ($119.7 million), training for aircrew and engineering staff ($12.4 million), evaluation and support ($0.4 million) and contingency ($104.2 million).*

General response from the Government

1.8 The Secretary for Security and the Controller, GFS generally agree with the audit recommendations.

Acknowledgement

1.9 Audit would like to acknowledge with gratitude the full cooperation of the staff of the GFS during the course of the audit review.

PART 2: PROVISION OF FLYING SERVICES

2.1 This PART examines the following issues relating to the provision of flying services by the GFS:

(a) performance targets of primary tasks (paras. 2.2 to 2.15);

(b) response rates for service requests (paras. 2.16 to 2.20); and

(c) other management issues (paras. 2.21 to 2.31).

Performance targets of primary tasks

2.2 According to the Policy Statement issued by the Secretary for Security and the GFS Operations Manual, the priorities for the use of the GFS's flying hours are as follows:

(a) essential aircrew training and examinations to acquire/maintain/renew aircrew categories, flight crew licences and qualifications;

(b) air tests of aircraft after maintenance work;

(c) primary tasks including emergency operations such as air ambulance service, search and rescue, operational support to the Hong Kong Police Force (HKPF) and other B/Ds in connection with civil emergencies, and airborne fire fighting;

(d) basic cadet pilot and ab-initio air crewman officer training, and other operational training; and

(e) secondary tasks which the GFS will perform when resources are not required for the primary ones. Should there be a last minute call on resources arising from a primary task, any commitments to secondary functions will be cancelled or postponed. Secondary tasks include other services provided to B/Ds such as aerial surveys, oil pollution surveillance and VIP flights.

In any emergency situation, the Controller, GFS is responsible for determining priorities between competing claims.

2.3 Performance measurement, including setting performance targets/indicators and their reporting (e.g. in the Controlling Officer's Report (COR)), helps enhance government performance, transparency and accountability. The GFS has set 23 performance targets in its COR for four types of primary tasks (air ambulance service, search and rescue, law enforcement and fire-fighting operations) carried out under different situations (Note 6). Each target (on-scene time target) is expressed as a percentage of the call-out cases (Note 7) in a year with the responding aircraft arriving on scene within the pledged time.

Some on-scene time targets not met

2.4 Between 2010 and 2014, the GFS responded to 11,175 call-outs (excluding the multiple call-out cases — see para. 2.8) relating to the 23 on-scene time targets, of which 902 call-out cases (or 8% of the total) could not meet the respective pledged on-scene times. On average, six (26%) of the 23 on-scene time targets were not met each year (see Appendix A). In particular, four targets were consistently not met for four to five years (see Table 3).

Note 6: *The different situations include different service locations, time of day of the call-outs and types of responding aircraft.*

Note 7: *The emergency call-out requests are normally made by the HKPF, the Fire Services Department, the Marine Department and the CAD. For air ambulance service, the Hospital Authority's requests are made through the HKPF.*

Table 3

Four on-scene time targets not met for four to five years (2010 to 2014)

Call-out for flying services		Pledged on-scene time (Minute)	Target (%)	Actual				
				2010 (%)	2011 (%)	2012 (%)	2013 (%)	2014 (%)
1	Air ambulance service: Type A+ and A casualty evacuation situations (Note 1) within Island Zone (Note 2)	20	90	95	**89**	**86**	**87**	**87**
2	Inshore search and rescue by helicopter: between 22:00 and 6:59 where additional crew/specialised equipment not required	40	90	**83**	**67**	**79**	**78**	**76**
3	Law enforcement: outside Island Zone where additional crew/specialised equipment not required	30	90	**79**	**73**	**83**	**76**	**80**
4	Fire fighting: water bombing	40	85	**74**	**72**	**76**	**65**	**74**

Source: *GFS records*

Note 1: *Type A+ denotes casualty evacuation involving life-threatening cases. Type A refers to casualty evacuation involving emergency medical conditions which are not life-threatening, and Type B refers to casualty evacuation involving lesser emergency.*

Note 2: *Island Zone includes Hong Kong Island, Cheung Chau, Hei Ling Chau, Lamma Island, Lantau Island, Peng Chau and Soko Islands.*

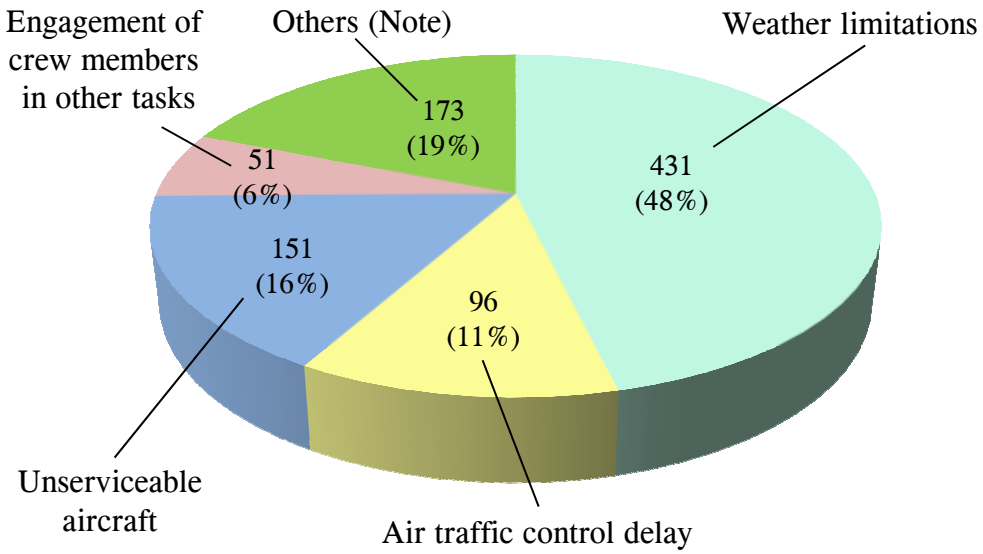
Remarks: *Actual performance figures not meeting the on-scene time targets are shown in bold.*

Out-of-pledge call-out cases

2.5 The GFS has maintained records of the reason for each out-of-pledge call-out case. Figure 1 shows an analysis of the reasons for the 902 out-of-pledge call-out cases.

Figure 1

Reasons for 902 out-of-pledge call-out cases (2010 to 2014)



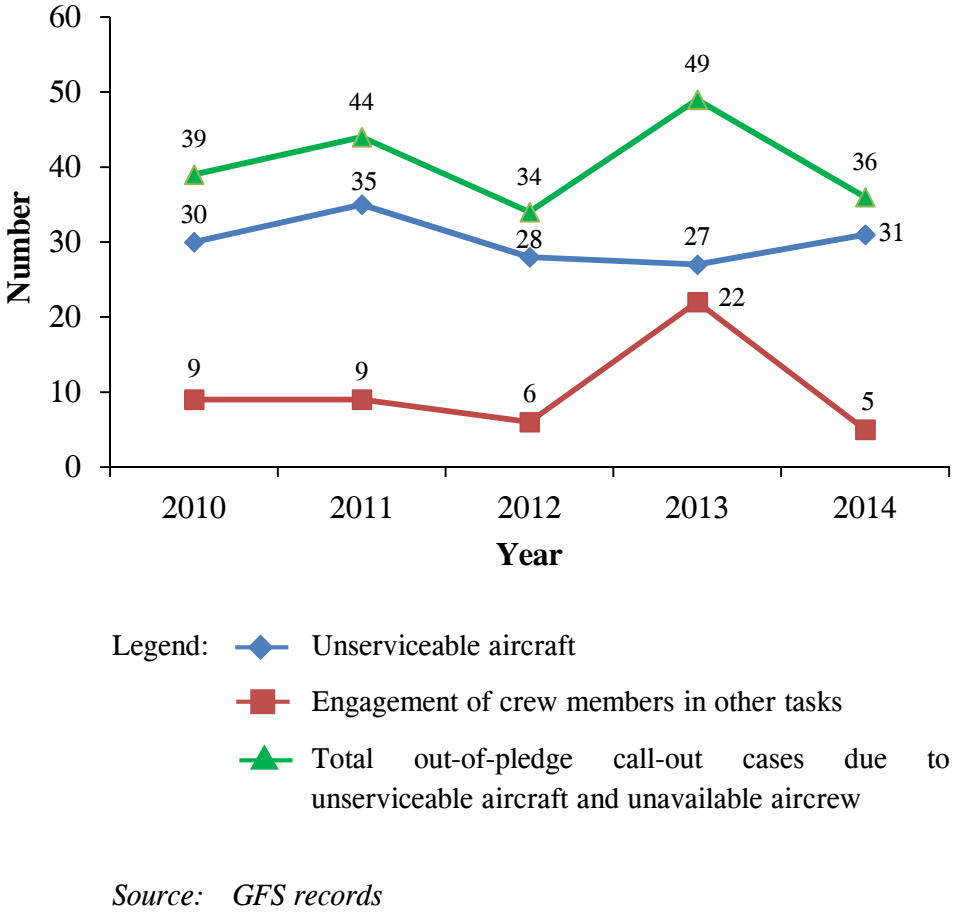
Source: *GFS records*

Note: *Other reasons included change of role of aircraft for different tasks (e.g. a helicopter undertaking a fire-fighting operation will have to be fitted with a different set of equipment from a rescue operation), longer flight time required due to extreme range and location, and fuel planning (e.g. for long-range search and rescue operations, the GFS may need to plan the refuelling of helicopters at oil rigs).*

2.6 Among the reasons for the out-of-pledge cases, weather limitations and air traffic control delay (accounting for 59% of the 902 cases) were not within the control of the GFS. For 202 (22%) out-of-pledge cases, they were caused by engagement of crew members in other tasks or unserviceable aircraft (management of aircrew members and maintenance of aircraft will be further discussed in PARTs 3 and 4). The annual figures for the out-of-pledge call-out cases from 2010 to 2014 are shown in Figure 2.

Figure 2

Number of out-of-pledge call-out cases due to unserviceable aircraft and engagement of crew members in other tasks (2010 to 2014)



Source: *GFS records*

Errors in reporting the total number of on time call-out cases

2.7 The GFS maintains a computerised Integrated Application System to record details of the flying tasks and to compile statistics for reporting performance in the CORs. While the System has captured the call-out time and the on-scene time of each task, there is no built-in function to automatically compare them with the pledged on-scene time to show whether it is an on time case. Such comparisons are done manually and the results are then input into the System by the GFS staff. Using computer-assisted audit technique, Audit found that the number of on time call-out cases was 311 less than that reported by the GFS for compiling performance statistics in the CORs for 2010 to 2014 (see Table 4). Audit noted that the GFS had secured funding from the Office of the Government Chief Information Officer in 2012 to upgrade the System in phases from 2012 to 2016. In Audit's view, the GFS needs to take this opportunity to automate certain procedures in recording and verifying the call-out data so that the processing and reporting of the number of on time call-out cases can be streamlined to minimise human error and improve operational efficiency.

Table 4

Discrepancies in the reported number of on time call-out cases (2010 to 2014)

On time call-out cases	2010	2011	2012	2013	2014	Total
As reported by the GFS (a)	1,771	1,931	2,071	2,249	2,251	10,273
Per Audit checking (b)	1,616	1,911	2,028	2,202	2,205	9,962
Difference (c) = (a) – (b)	155	20	43	47	46	311

Source: Audit analysis of GFS data

Subsequent responses not measured in reporting multiple call-out cases

2.8 From time to time, there were cases when the number of call-outs within a period of time exceeded the maximum number to which the GFS could possibly respond. Under such circumstances, one GFS aircraft had to respond to multiple call-out requests sequentially within that period. The GFS has laid down priority guidelines in meeting competing demands for its primary tasks (see para. 2.2(c)). For example, top priority is accorded to search and rescue, and air ambulance service, followed by urgent operational need of the HKPF, and other operational tasks of the law enforcement departments and the Fire Services Department.

2.9 Before 2003, for multiple call-outs at different locations carried out by the same crew, only the on-scene time of the first call-out was used for measuring performance against the set targets. After a review in 2003, the GFS announced the following changes in the 2004-05 COR in order to give a more accurate picture on how the GFS performed:

(a) from 2003 onwards, the on-scene time of all call-outs would be used for measuring performance against the set targets; and

(b) in view of the revised arrangement for measuring performance of multiple call-outs, the percentage within target for Type A+ and A air ambulance service was revised from 95 in 2003 to 90 in 2004 to provide a more realistic target.

In the CORs for the subsequent years up to 2008-09, the GFS had provided explanatory notes where the target percentage of on time call-outs for a particular service could not be achieved due to delays in responding to multiple call-outs at different locations.

2.10 According to the Guidelines issued by the Financial Services and the Treasury Bureau, Controlling Officers should make sure that the information set out in the CORs is substantiated and accurate. In an examination of the reported performance data in the CORs for 2010 to 2014, Audit found that the GFS had changed the reporting basis from including all multiple call-outs to excluding all subsequent responses from both the total number of call-out cases and the number of

cases meeting the pledged targets. The number of such subsequently responded tasks of multiple call-outs that was not used for compiling the CORs totalled 609 (equaling to 5.4% of the 11,175 reported call-out cases — see para. 2.4). Audit analysis of these 609 unreported multiple call-out cases revealed that:

(a) 550 (90%) could not meet the pledged on-scene times. While these multiple call-out cases were not reported in the CORs, the GFS used the target of 90% on time call-out cases for measuring the performance of Type A+ and A air ambulance service. The 90% target (down from 95% in 2003) was actually set in 2004 for taking into account multiple call-out cases (see para. 2.9 (b)); and

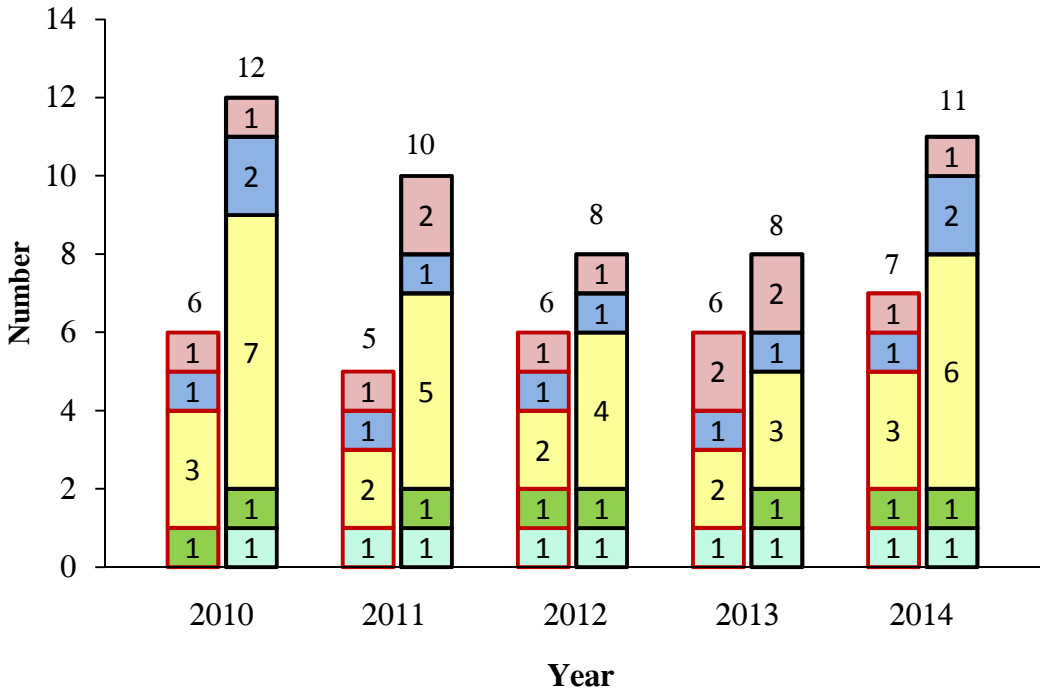
(b) 500 (82%) were of the top priority category (i.e. 393 (65%) for Type A+ and A air ambulance service, and 107 (17%) for search and rescue — see para. 2.8).

2.11 In the CORs for 2010 to 2014, the GFS had not provided any explanation on the changes in the basis of reporting multiple call-out cases but using a target set for multiple call-outs to measure the performance of Type A+ and A air ambulance service. In Audit's view, the GFS should review the issue and take measures to improve the reporting of multiple call-out cases.

2.12 After making adjustments for the overstated 311 on time call-out cases and 550 unreported multiple call-out cases which could not meet the pledged times (see paras. 2.7 and 2.10(a)), Audit found that the total number of on-scene time targets not met was 49 (averaging 9.8 per year) instead of 30 (averaging six per year) as reported by the GFS in the CORs for the five years from 2010 to 2014 (see Figure 3).

Figure 3

Number of on-scene time targets not met (2010 to 2014)



Legend:
- Reported by the GFS in CORs
- Adjusted by Audit
- Type A+ and A air ambulance service
- Type B air ambulance service
- Search and rescue
- Law enforcement
- Fire fighting

Source: Audit analysis of GFS data

Audit recommendations

2.13 **Audit has *recommended* that the Controller, GFS should:**

(a) **enhance the computer system with a view to automating certain procedures in recording and verifying call-out data so as to improve the accuracy and efficiency in reporting performance information; and**

(b) **improve the reporting of the performance of multiple call-out cases in the CORs.**

Response from the Government

2.14 The Controller, GFS generally agrees with the audit recommendations and will take follow-up actions accordingly.

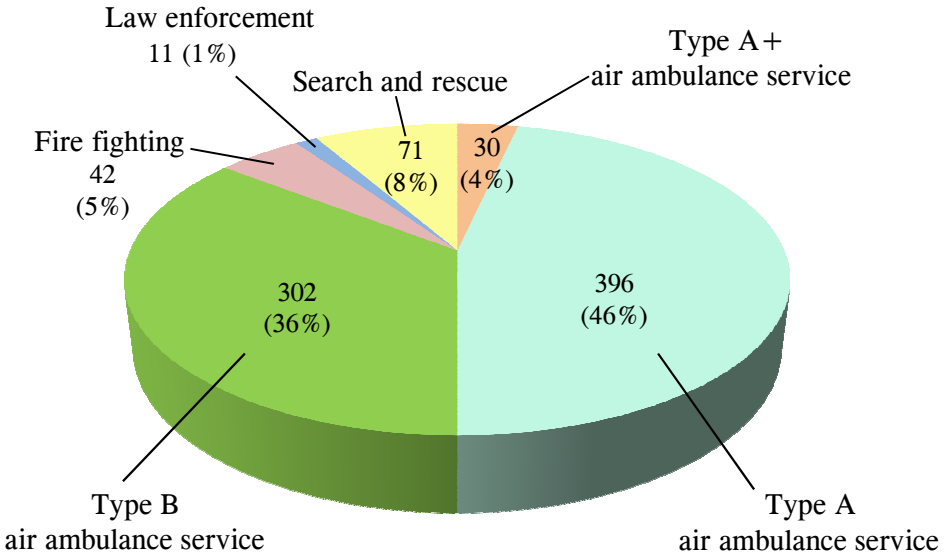
2.15 The Secretary for Financial Services and the Treasury has said that the Financial Services and the Treasury Bureau will closely monitor the GFS's follow-up actions when preparing its future Estimates/CORs.

Response rates for service requests

2.16 Upon receiving a request for flying services, the GFS will arrange aircraft and aircrew to respond with due consideration given to the urgency, weather conditions, availability of air assets and tasking priority. During the period 2010 to 2014, the GFS could not respond to a total of 852 service requests (8% of the total 11,175 responded cases) after examining all relevant factors. Analyses of these declined cases by service types and by reasons are shown in Figures 4 and 5 respectively. Out of the 852 declined service requests, 81% were due to weather limitations.

Figure 4

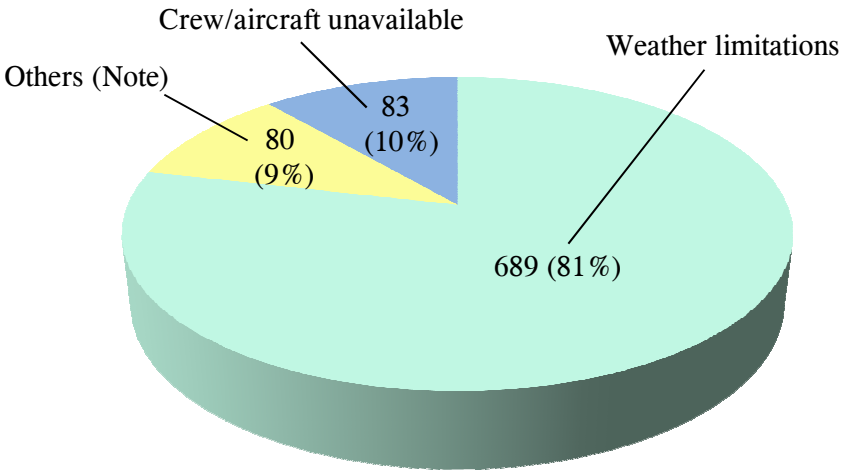
Analysis of 852 declined call-outs by service types (2010 to 2014)



Source: Audit analysis of GFS data

Figure 5

Reasons for declining 852 call-outs (2010 to 2014)



Source: Audit analysis of GFS data

Note: These included declined air ambulance service due to unsuitable patient conditions and declined fire-fighting services after sunset.

2.17 Audit found that the GFS had not duly taken into account the 852 declined call-out cases when reporting its response rates to flying services in the CORs for 2010 to 2014, as follows:

(a) with the exception of one service in 2010, the GFS reported that it had responded to 100% of all other service call-outs. A recasting of the response rates after taking into account the 852 declined cases is shown in Table 5; and

(b) the GFS's guideline on the compilation of statistics for CORs stated that "the percentage of call-outs responded to figure can always be assumed to be 100% as GFS always makes a response even if the response is to decline the sortie after examining all the factors". Audit considers that the GFS needs to review the guideline as the assumed 100% response rates could give rise to misunderstanding that the GFS had provided flying services for all the requests it received, which was actually not the case. It would help stakeholders better understand the actual situation if declined cases are taken into account in reporting the response rates in the CORs. The reasons for declining service requests can be included as explanatory notes so that the response rates will be seen in context.

Table 5

Response rates after taking into account the declined cases (2010 to 2014)

Flying service	2010	2011	2012	2013	2014
Air ambulance service	90% (100%)	95% (100%)	91% (100%)	93% (100%)	94% (100%)
Search by fixed-wing aircraft	94% (100%)	100% (100%)	89% (100%)	100% (100%)	100% (100%)
Rescue by helicopters	93% (100%)	98% (100%)	97% (100%)	97% (100%)	96% (100%)
Law enforcement	95% (97%)	100% (100%)	99% (100%)	96% (100%)	98% (100%)
Fire fighting	92% (100%)	85% (100%)	88% (100%)	88% (100%)	91% (100%)

Source: *Audit analysis of GFS data*

Remarks: *Figures in brackets were the GFS's reported response rates (see para. 2.17(a)).*

Audit recommendations

2.18 **Audit has *recommended* that the Controller, GFS should:**

(a) **take into account declined cases in reporting the response rates for service requests in the CORs; and**

(b) **review the relevant guideline on performance reporting to include this requirement accordingly.**

Response from the Government

2.19 The Controller, GFS generally agrees with the audit recommendations. He has said that the GFS will make reference to the practices of other disciplined services departments in reviewing the presentation of the COR.

2.20 The Secretary for Financial Services and the Treasury has said that the Financial Services and the Treasury Bureau will closely monitor the GFS's follow-up actions when preparing its future Estimates/CORs.

Other management issues

Provision of familiarisation flight service for other B/Ds

2.21 The General Regulations have stipulated the following requirements on the use of flying services by B/Ds:

(a) when training and operational commitments permit, the GFS may carry out suitable flying tasks for B/Ds. However, such flights will only be approved if they are considered to be in the public interest and when no other form of transport would be suitable in the circumstances; and

(b) since it is impracticable to lay down precisely the circumstances in which the use of aircraft by government officers is justified, responsibility is placed on Heads of B/Ds and their authorised senior officers (normally at directorate level) to make sure every request is necessary.

2.22 ***Standard familiarisation flights for guests.*** Carrying passengers is one of the statutory functions of the GFS. From time to time, B/Ds made requests for flying services to carry passengers for various purposes, such as expediting conveyance of passengers to remote areas and providing familiarisation tour of Hong Kong. From 2010 to 2014, the number of such familiarisation flights provided by the GFS increased from 54 by 7% to 58. During the period, the GFS also arranged, on average, 26 familiarisation and passenger flights each year (including flights for charity and youth organisations). Audit's sample check of the passenger lists of these flights revealed that passenger details were not always recorded. The lack of proper recording of passenger details on the GFS's flights

could undermine public accountability. The GFS needs to make improvement in this regard. In 2013, some Members of the Legislative Council expressed concern over media reports of alleged abuse of the GFS services. To allay public concern and enhance transparency, consideration should be given to proactive disclosure of annual statistics on the provision of familiarisation flight service with a breakdown by user B/Ds (say on the GFS's website).

2.23 ***Need to raise B/Ds' cost-consciousness in using familiarisation flight service.*** According to the GFS's COR for 2014, the direct operating cost (Note 8) of the helicopter (EC155) was $23,890 per hour and $35,270 per hour for the Super Puma. In the absence of interdepartmental charging (Note 9), user B/Ds may not be cost-conscious of their demand for familiarisation flight service. In the light of the competing demands for the GFS's limited resources (see para. 2.16), the GFS needs to raise B/Ds' cost-consciousness in using the familiarisation flight service (e.g. through proactive disclosure of the cost of services provided to them).

Management review of flying services needed

2.24 The GFS prepares monthly statistics on the extent of achievement of the 23 on-scene time targets and the number of out-of-pledge call-out cases (with a breakdown of the underlying reasons) for the attention of its senior management. While these statistics are useful in providing an overview of the performance of the GFS services, there is merit to also highlight the exceptional cases for the management's review, including the following:

(a) ***Out-of-pledge cases in providing top priority emergency services.*** Long time taken in providing the top priority emergency services (i.e. Type A+ and A air ambulance service, and search and rescue) is undesirable. From 2010 to 2014, of the 202 out-of-pledge cases (or 1.8% of the total 11,175 responded cases) due to unavailable crew/aircraft, 72 were top priority cases and the times taken for responding to the call-outs exceeded the respective pledged on-scene times by more than 50%. Cases 1 and 2 are examples of such cases;

Note 8: *The direct operating cost only included fuel cost and maintenance cost.*

Note 9: *Financial and Accounting Regulation 435 states that except where special approval has been given by the Secretary for Financial Services and the Treasury, no charge will be made for services rendered by one department to another.*

(b) ***Declined cases due to resource limitations.*** Failure in providing emergency services is undesirable, in particular those of top priority. Of the 83 declined call-outs (or 0.7% of the total 11,175 responded cases from 2010 to 2014) due to unavailable crew/aircraft (see Figure 5 in para. 2.16), 32 were related to top priority emergency services; and

(c) ***Out-of-pledge cases due to not prioritising services in accordance with laid-down instructions.*** According to the instructions issued by the Secretary for Security, should there be a last minute call on resources arising from a primary task (e.g. air ambulance service), any commitments to secondary functions (e.g. familiarisation flight) will be cancelled or postponed (see para. 2.2(e)). Case 3 is an example of out-of-pledge cases with apparently task prioritisation problem.

Case 1

Out-of-pledge case due to unavailable aircrew

On 28 May 2013, the GFS received a call-out at 8:42 to support the ground parties of the Fire Services Department and the HKPF in conducting a search for a suspected distress person. At that moment, four helicopters engaging six pilots had been scheduled to provide operational training support for the HKPF starting from 8:45. At 8:50, the GFS informed the Fire Services Department that it would arrange for the search when resources became available with the estimated arrival time after 10:00 (Note). At 10:08, the GFS diverted one of the helicopters from the training tasks to assisting in the aerial search operation. The on-scene time at 10:45 exceeded the performance target of 40 minutes by 83 minutes.

Source: *GFS records*

Note: *In February 2015, the GFS informed Audit that on 28 May 2013, the GFS was not able to immediately respond to the search call-out case as its aircraft and aircrew were engaged in other tasks, and information on the exact location of the incident and the nature of the call-out was not available initially. The GFS diverted a helicopter to assist in the search operation when additional information was subsequently made available. However, such additional information was not documented in the GFS records.*

Case 2

Out-of-pledge case due to unserviceable aircraft

1. On 22 December 2014, the GFS received a call-out for Type A air ambulance service at 16:53. However, the responding helicopter (EC155) was reported to have a nose wheel problem by the pilot before take-off. Additional time was spent on changing helicopter. Hence, the on-scene time exceeded the performance target of 20 minutes by 15 minutes.

2. Subsequently, the Engineering Section investigated the case and arranged to replace potentially problematic brakes of all the EC155 helicopters as a proactive measure to prevent similar problems from happening in the future (see para. 4.12).

Source: GFS records

Case 3

Out-of-pledge case due to scheduled familiarisation flight

1. On 16 April 2013, the GFS received call-outs for Type B and Type A air ambulance service (CAS3 and CAS4) at 10:48 and 11:26 respectively. According to the tasking agent (i.e. the HKPF) of the Type A call-out, the patient would be ready in 30 minutes (i.e. at 11:56). At that moment, two helicopters engaging three pilots had been deployed for other air ambulance services (CAS1 and CAS2), and one other helicopter operated by a pilot (Pilot A) was providing a familiarisation flight (FF1). A fourth helicopter available on ground was scheduled to provide the next familiarisation flight (FF2) starting at 11:40.

2. At 11:28, Pilot A informed the GFS that he would respond to the air ambulance call-outs (CAS3 and CAS4) using another helicopter fitted with equipment for air ambulance service purposes after finishing the familiarisation flight (FF1). While another pilot (Pilot B) returned from the air ambulance service (CAS1) at 11:30, the GFS decided to deploy him to operate the familiarisation flight (FF2) as scheduled at 11:40, after considering Pilot A's acknowledgement and the time of patient's readiness. In the event, Pilot A returned from the familiarisation flight (FF1) at 11:45 and changed to another helicopter (previously used for CAS1). It was airborne at 12:03 and arrived on scene at 12:08, exceeding the time specified by the tasking agent of 11:56 by 12 minutes.

Source: GFS records

Need to monitor the proper use of Type B air ambulance service

2.25 Air ambulance service accounted for about one-third of the total operation flying hours of the GFS. From 2010 to 2014, the number of call-outs for air ambulance service totalled 10,005 (Note 10). While the number of call-outs for Type A+ air ambulance service decreased by 4%, there were increases in Type A and Type B services, ranging from 11% to 82% (see Table 6). According to the GFS Operations Manual and the guidelines issued by the Hospital Authority, Type B air ambulance service should be requested by medical doctors for patients suffering from conditions of lesser emergency and for which public transport is not appropriate. Type B air ambulance service is only available between 7:00 and 21:59, and the pledged on-scene time is 120 minutes.

Table 6

Call-outs for air ambulance service
(2010 to 2014)

Type of casualty evacuation	2010	2011	2012	2013	2014	Percentage of increase/ (decrease) between 2010 and 2014
	(Number)					
Type A+	188	195	191	182	180	(4%)
Type A	1,132	1,196	1,271	1,335	1,258	11%
Type B	382	432	638	730	695	82%
Overall	1,702	1,823	2,100	2,247	2,133	25%

Source: Audit analysis of GFS data

Note 10: *Of the 10,005 call-out requests, 728 (30 Type A+, 396 Type A and 302 Type B) were declined by the GFS (see Figure 4 in para. 2.16) and 141 were withdrawn by the tasking agents.*

2.26 The significant increase in Type B air ambulance service call-outs between 2010 and 2014 was mainly attributable to the increase in the number of cases for Cheung Chau (from 257 by 109% to 536) and Lantau Island (from 59 by 12% to 66). Audit noted that the auxiliary medical officers of the GFS would re-assess some of the Type B call-out requests. As a result of such re-assessments, other modes of transport had been used to transfer some patients of Cheung Chau and Lantau Island, indicating that there could be room for improvement in the initial assessments of the patients' need. The following cases are some examples:

(a) in 2012, there were two Type B call-out cases on Cheung Chau for which the transfer of patients by vessels instead of air ambulance service was considered appropriate having regard to their stable condition and low urgency; and

(b) similarly in 2010, there were three Type B call-out cases on Lantau Island for which the transfer of patients by land transport was considered appropriate.

2.27 Bearing in mind that the primary duties of the auxiliary medical officers of the GFS are to provide specialist trauma and emergency treatment to the patients on board the aircraft (see Note 1 to para. 1.3), it is important that the initial patient assessments are properly carried out in the first place with due regard to patient safety and proper use of the GFS flying resources. In March 2015, in response to Audit's enquiries, the Hospital Authority said that it had updated the casualty evacuation guidelines for the classification of patients for such service by its medical staff and other user departments in January 2015. In Audit's view, the Hospital Authority needs to closely monitor the implementation of and compliance with the updated guidelines to see if further enhancement is necessary.

Audit recommendations

2.28 **Audit has *recommended* that the Controller, GFS should:**

(a) **enhance transparency and accountability in the provision of familiarisation flight service by:**

(i) **maintaining proper records of all passengers carried on such flights; and**

(ii) **considering proactive disclosure of annual statistics on the provision of familiarisation flight service with a breakdown of the usage and related costs by user B/Ds;**

(b) **strengthen the monthly management review of the performance of the GFS flying services by placing more emphasis on the exceptional cases such as those relating to long time taken/failure in providing top priority emergency services; and**

(c) **take measures to ensure that the laid-down tasking priorities are followed in responding to competing demands for the GFS flying services.**

2.29 **Audit has *recommended* that the Chief Executive, Hospital Authority should closely monitor the implementation of and compliance with the updated casualty evacuation guidelines by its medical staff to see if further enhancement is necessary.**

Response from the Government

2.30 The Controller, GFS generally agrees with the audit recommendations in paragraph 2.28. Regarding the recommendation in paragraph 2.28(c), he has said that:

(a) because of the multi-role nature of the GFS, resource constraints and strong demand for the GFS flying services, resources of the GFS are always engaged in different emergency missions, and essential training and tasks instead of standing by on ground. Inevitably there are occasions where a new emergency call-out comes in when all available aircraft and/or aircrew members are engaged in other tasks. Under such circumstances, while a system for monitoring the deployment of resources

is in place, the GFS still relies on the professional judgement of flight operation supervisors to determine the relative urgency of competing demands and complexities of individual flying missions in deploying its resources to deliver services in the most appropriate and effective way;

(b) the GFS has already issued internal guidelines on the need to observe tasking priorities to facilitate more effective and efficient deployment of limited resources; and

(c) the GFS will also continue to produce daily occurrence review reports and weekly event summary reports, and highlight the out-of-pledge cases for review and monitoring by the senior management.

2.31 The Chief Executive, Hospital Authority agrees with the audit recommendation in paragraph 2.29. He has said that the Hospital Authority will continue to monitor the implementation of and compliance with the casualty evacuation guidelines by its medical staff (such as regular audits).

PART 3: MANAGEMENT OF AIRCREW MEMBERS

3.1 This PART examines the following issues relating to the management of the GFS aircrew members for flying duties:

(a) manning for 24-hour flying services (paras. 3.2 to 3.10); and

(b) aircrew duty and rest hours (paras. 3.11 and 3.12).

Manning for 24-hour flying services

3.2 The GFS is required to provide emergency response on a 24-hour basis year-round. Subject to flight and duty regulations as stipulated by the CAD, the GFS has to roster on a daily basis sufficient suitably qualified crew members to work in three shifts to operate its aircraft for providing the essential services. Table 7 summarises the crew requirements for operating each type of aircraft.

Table 7

Crew requirements for operating each type of aircraft

Aircraft type	Number of pilots required	Number of air crewman officers required
Super Puma helicopter	2	1 to 2
EC155 helicopter	1 (day) 2 (night)	1
J-41 fixed-wing aircraft	2	1

Source: GFS records

3.3 As at 31 December 2014, the GFS had 37 pilots and 31 air crewman officers on civil service terms. In addition, the GFS employed three pilots and two air crewman officers on non-civil service terms. The establishment and strength of the pilot and air crewman officer grades are shown in Appendix B. Of the 40 pilots (Note 11), 12 were in the aeroplane stream while 28 were in the helicopter stream (Note 12).

3.4 ***Roster planning.*** According to the GFS Operations Manual, at the present staffing level, there are sufficient pilots to man three shifts per day for the helicopter stream but only two shifts for the aeroplane stream. As a guideline, the Manual sets out the minimum crew requirements (Note 13) for each shift to meet the primary emergency response in addition to other planned tasking commitments (see Table 8). Any call-out for emergency response of the aeroplane stream during the Shift C period will be subject to the call-in of available crew to respond. The shift rosters are published in advance so that crew members can plan for adequate pre-duty rest. The rostering period is for a cycle of 28 consecutive days. For any change in shift duty, a crew member should be given a minimum of 12 hours prior notification, otherwise it will be treated as an emergency call-in.

Note 11: *The pilot grade comprises Cadet Pilot, Pilot II, Pilot I, Senior Pilot and Chief Pilot. In addition to their operational flying duties, the Senior Pilots and Chief Pilots are responsible for providing in-house training for junior pilots and testing of their flying skills. As part of the senior management of the GFS, they also assume administrative duties, for example, the planning and review of aircrew's overseas training, management of aircraft replacement projects, operational planning such as development and reprovisioning of new helipad, and assessment of the adverse impact on the operations of the GFS from large-scale infrastructure projects.*

Note 12: *In March 2015, the GFS informed Audit that four aeroplane pilots and 10 helicopter pilots were still under training at various stages. According to the GFS, there will always be some pilots undergoing different stages of training and upgrading.*

Note 13: *According to the GFS, the manning level is a guideline for the supervisor to roster the 24-hour coverage. It is not a mandatory requirement and roster planning largely depends on crew availability and qualifications, and other commitments.*

Table 8

Minimum crew requirements for each shift of flying duties a day

Shift	Time	Number of pilots	Number of air crewman officers	Minimum capacity
Aeroplane stream				
A	7:00 to 15:50	2	1	One team for long-range search and rescue using one J-41
B	13:10 to 21:59	2	1	One team for long-range search and rescue using one J-41
	Total	4	2	
Helicopter stream				
A	7:00 to 15:50 (Note 1)	3	3	One team for search and rescue using one Super Puma and one team for air ambulance service using one EC155
B	13:10 to 21:59 (Note 2)	3	3	One team for search and rescue using one Super Puma and one team for air ambulance service using one EC155
C	21:59 to 6:59	2	1	One team for search and rescue or air ambulance service using Super Puma/EC155 (Note 3)
D (on weekdays only)	8:10 to 17:00	2	1	To supplement the Shift A by providing additional coverage for multiple call-outs, government task support and training flights using Super Puma/EC155s
	Total	10	8	

Source: GFS records

Note 1: One pilot and one air crewman officer will be on duty at 6:30 to provide air ambulance coverage earlier. They will be off duty at 15:20.

Note 2: One pilot and one air crewman officer will be on duty at 13:40 and off duty at 22:30.

Note 3: The capacity of Shift C to provide emergency coverage overnight will depend on the crew qualifications and combination.

Minimum crew requirements not met in some shifts

3.5 In 2013 and 2014, the GFS arranged a total of 4,142 shifts to provide the primary emergency response in addition to meeting other planned tasking commitments. Audit analysis of the shift rosters of the pilots for the two years revealed that 178 shifts (or 4.3% of the 4,142 shifts) were manned by fewer pilots than the minimum stipulated in the guideline (see Table 9). In particular, no aeroplane pilot was rostered for 65 shifts (37% of the 178 shifts or 1.6% of the 4,142 shifts) in 2013 and 26 shifts (15% of the 178 shifts or 0.6% of the 4,142 shifts) in 2014.

Table 9

Number of shifts when fewer pilots were rostered than the minimum stipulated in the guideline (2013 and 2014)

Shift	Aeroplane stream		Helicopter stream		Total
	2013	2014	2013	2014	
Monday to Friday excluding public holidays					
A	23	12	7	7	49
B	20	8	6	5	39
C	Not applicable (Note)		0	0	0
D			0	1	1
Subtotal	43	20	13	13	89
Saturday, Sunday and public holidays					
A	21	9	11	8	49
B	21	11	6	2	40
C	Not applicable (Note)		0	0	0
Subtotal	42	20	17	10	89
Total	85	40	30	23	178

Source: *Audit analysis of GFS data*

Note: *There were no Shifts C and D for the aeroplane stream (see para. 3.4).*

Remarks: *For 14 shifts in the aeroplane stream and 25 shifts in the helicopter stream, totalling 39 (22%) shifts of the 178 shifts, the shortfall in pilots was due to sick leave. For the other shifts, the shortfall was due to leave, mandatory day-off and overseas training.*

3.6 According to the GFS shift rosters, the daily average number of pilots on duty on weekdays in 2013 and 2014 was 21 (16 for helicopter stream and 5 for aeroplane stream, i.e. above the minimum requirements). However, Audit noted that there were occasions when the number of pilots on duty was below the minimum. As a result, some call-out cases were delayed or declined (Note 14). Cases 4 and 5 are examples of such delayed and declined cases. For the aeroplane stream, on 19 weekdays in 2013 and 10 weekdays in 2014, only two to three aeroplane pilots were on duty. For example, on 17 January 2014, of the 12 aeroplane pilots, only three were on duty, three on leave, four on mandatory day-off and two on overseas training. As the primary role of the GFS is to provide emergency services, it needs to maintain the sufficient crew for each shift to provide the basic level of operational capacity.

Case 4

Out-of-pledge case in providing air ambulance service

On 3 October 2013, only two helicopter pilots were rostered for Shift B (i.e. falling short of the manning level for Shift B by one pilot) as one of the three Shift B pilots was redeployed to take up daytime duty in Shift D to cover other operational commitments. At 20:22, the GFS received a call-out for Type A air ambulance service. At that moment, the two helicopter pilots were engaged in a search and rescue operation on a Super Puma. As there was no other pilot available, the case was responded to after the pilots had returned from the search and rescue operation. The helicopter arrived on scene at 20:54, exceeding the performance target of 20 minutes by 12 minutes.

Source: GFS records

Note 14: *According to the GFS, the number of pilots (i.e. 37 pilots on civil service terms and three pilots on non-civil service terms) were sufficient to meet the manning level in the guideline. However, as around 35% to 40% of the pilots were under training at various stages and hence, not all pilots were fully qualified for all types of missions/tasks in the shifts. Training and license tests were also their high priority tasks.*

Case 5

Declined request for air ambulance service

On 12 February 2013, two helicopter pilots were rostered for Shift D but only two for Shift B (i.e. falling short of the manning level for Shift B by one pilot). At 16:56, the GFS received a call-out for Type A air ambulance service. At that moment, all the four pilots were engaged in three search and rescue operations. As there was no other pilot available, the case was turned down by the GFS and taken over by the HKPF without air support.

Source: GFS records

Need to improve call-in arrangement for night-time search and rescue

3.7 As mentioned in paragraph 3.4, at the existing staffing level, the GFS can only arrange two shifts (i.e. Shifts A and B) for the aeroplane stream. For any call-outs for long-range search and rescue during Shift C period (i.e. night time), the GFS needs to call in any available pilots and air crewman officers. According to the GFS Operations Manual, the following ground rules apply when calling in crew members for emergency operations:

(a) crew members who are on leave shall not be called in;

(b) no cancellation of crew members' mandatory day-off (Note 15) is allowed;

Note 15: *A crew member shall: (a) not work more than six consecutive days; (b) have 2 consecutive days off in any consecutive 14 days following the previous 2 consecutive days off; (c) have at least 7 days off in any consecutive 28 days; and (d) have at least 24 days off in any three consecutive rostered 28 days period.*

(c) prior to crew members being called in, there should be no reduction in their rest period. Meanwhile, crew members shall not be disturbed in their mandatory rest period (Note 16); and

(d) to call in crew members who are originally on Shift A or D on the following day may lead to a reduction in crew strength available for normal tasking on the following day. Under this circumstance, cancellation or postponing of the tasking is acceptable.

3.8 Taking into account the call-in arrangement, the pledged on-scene times for the long-range search and rescue services during night time are 60 minutes longer than those for daytime and evening (Shifts A and B).

3.9 Between 2010 and 2014, the GFS received 103 call-outs requiring the fixed-wing aircraft for long-range search and rescue (Note 17). Of the 103 call-outs, 26 (25%) were received during night time requiring the call-in of pilots and air crewman officers. In 2014, there was one occasion on which the GFS had difficulties calling in the crew members, resulting in longer time taken in responding to the call-out (see Case 6). In Audit's view, the GFS needs to explore ways to improve the call-in arrangement in order to meet the service demand for long-range search and rescue service during night time.

Note 16: *The minimum rest period prior to a duty period shall be at least as long as the preceding duty period or 12 hours, whichever is the greater.*

Note 17: *The figure did not include 10 call-outs that required both helicopter and fixed-wing aircraft, and for which the helicopter arrived on scene first. For performance measurement purpose, the GFS only uses the on-scene time of the first arriving aircraft.*

Case 6

Out-of-pledge case in providing search and rescue service due to difficulties calling in crew members

1. On 11 October 2014, the GFS received a call-out at 22:47 for long-range search and rescue which required the synchronised arrival of a helicopter and a fixed-wing aircraft. For the helicopter, refuelling at an oil rig was also required. While the helicopter pilots on Shift C duty were then available, there was no overnight shift arrangement for the aeroplane stream and the GFS needed to call in available fixed-wing pilots.

2. At 22:50, the GFS successfully called in a pilot and an air crewman officer. However, another pilot could only be called in one hour later at 0:01 on 12 October 2014. After confirmation of availability of both helicopter and fixed-wing aircraft crew, the helicopter was airborne at 0:15 and arrived on scene at 2:35. The fixed-wing aircraft was airborne at 1:18 and arrived on scene at 2:30, exceeding the pledged time of 185 minutes by 38 minutes (see Note 17 to para. 3.9).

Source: GFS records

3.10 In March 2015, in response to Audit's enquiries, the GFS said that:

(a) due to pre-mature wastage of pilots (in particular for the aeroplane stream) and the increase in the number of call-outs in recent years, the GFS was suffering from manpower shortage problems in its pilot grade. Unlike many other grades in the civil service, it was difficult to implement short-term measures to relieve the manpower pressure of the pilot grade;

(b) the GFS had been implementing a number of measures, including speeding up its recruitment and training process, to mitigate the problem in the longer term; and

(c) the GFS would make continuous effort to review the manning needs with a view to enhancing the night-time coverage.

Aircrew duty and rest hours

3.11 The GFS operates in accordance with civil aviation rules and regulations which require the setting of the maximum flying hours, maximum duty hours and minimum rest hours (Note 18) for pilots and air crewman officers in different shifts to ensure their safety and health in flight operations. Due to the complexity and dynamic nature of the operational response, any need to extend the flying hours or duty hours, or to reduce the rest time has to be recorded in a Commander Discretion Report (CDR). The GFS aims to minimise the number of CDRs and sets a target (Note 19) each year to serve as a safety performance indicator.

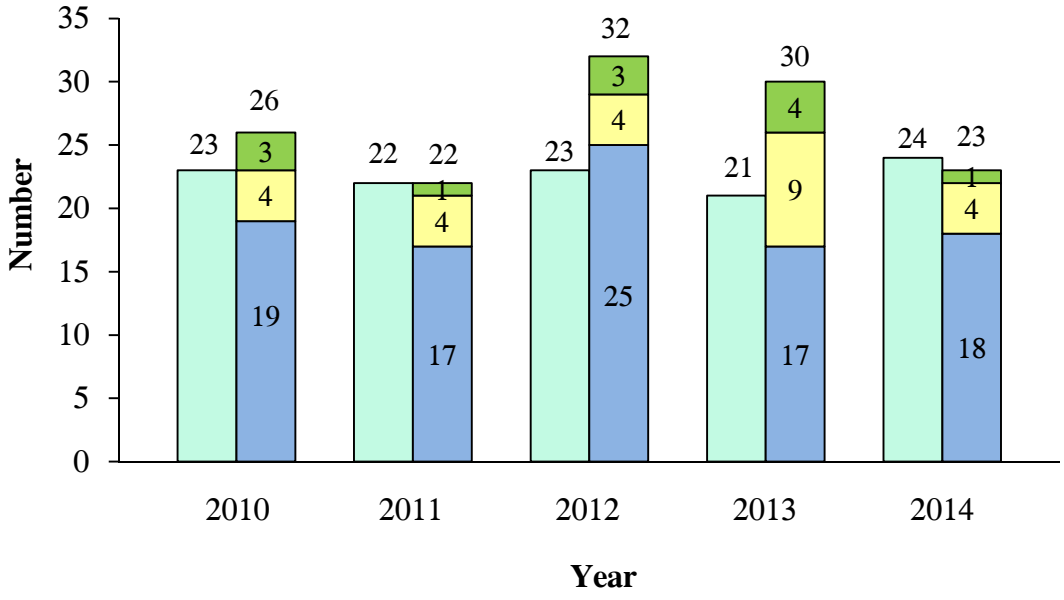
3.12 During the five-year period from 2010 to 2014, the GFS could not meet the targets in three years (see Figure 6). Of the total 133 CDRs, 52 involved pilots, 76 involved air crewman officers and 5 involved both of them. Audit noted that the number of CDRs had decreased in the past three years (from 32 in 2012 to 23 in 2014) and the CDR target was met in 2014. However, the GFS needs to continue closely monitoring the situation and take effective measures to address the issue.

Note 18: *Depending on the types of shift and aircraft operated, the maximum flying hours range from five to eight and the maximum duty hours range from eight to 12 (see Note 16 to para. 3.7(c) for minimum rest hours).*

Note 19: *The safety target for each year is the average number of CDRs in the preceding five years.*

Figure 6

Number of CDRs
(2010 to 2014)



Legend: Target (overall)
Actual: extended duty hour cases
Actual: reduced rest time cases
Actual: extended flying hour cases

Source: GFS records

Audit recommendations

3.13 **Audit has *recommended* that the Controller, GFS should:**

(a) **make greater effort to maintain sufficient crew for each shift of flying duties to provide a reliable primary emergency response;**

(b) **explore ways to improve the call-in arrangement in order to meet the demand for long-range fixed-wing aircraft search and rescue service during night time; and**

(c) **continue to closely monitor the extent of attainment of the CDR targets and take effective measures to enhance the safe and healthy working conditions for the crew members.**

Response from the Government

3.14 The Controller, GFS generally agrees with the audit recommendations. He has said that the GFS will make continuous efforts to review the manning levels and manpower deployment of the aircrew against the service needs without compromising flight safety and aircrew health.

PART 4: MAINTENANCE OF AIRCRAFT

4.1 The GFS is an approved maintenance organisation and design organisation under the Hong Kong Aviation Requirements. Its maintenance activities are under the CAD's continuous monitoring and periodic audits. The GFS's Engineering Section is responsible for all in-house maintenance and servicing of the nine operational and two training aircraft as well as all related mission equipment. This PART examines the following issues relating to the maintenance of the operational aircraft (Note 20):

(a) aircraft availability target (paras. 4.3 to 4.6); and

(b) aircraft downtime (paras. 4.7 to 4.17).

4.2 In general, the maintenance of aircraft is classified into:

(a) ***Routine maintenance.*** It covers scheduled aircraft inspections and component maintenance work:

(i) ***Aircraft inspections.*** There are two types of aircraft inspections. First, an annual inspection for each aircraft is required before the renewal of the Certificate of Airworthiness by the CAD. Second, each type of aircraft has its own mandatory inspection cycle to ensure continued airworthiness and serviceability. The cycle is usually specified by reference to the number of flying hours or the duration between inspections; and

(ii) ***Component maintenance work.*** It relates to the maintenance, replacement or overhaul work of life-specific components, such as engines, gearboxes and propellers; and

---

Note 20: *The maintenance issues of the two training aircraft are discussed in PART 5 of this Audit Report.*

(b) ***Unscheduled maintenance.*** It is carried out to repair the aircraft before they can be used as a result of defects/incidents reported by pilots and/or found during pre-flight, between two flights and after flight inspections. According to the GFS, depending on the nature of the defects reported or identified, it is difficult to estimate or guarantee the duration of time spent on investigation and subsequent rectifications.

Aircraft availability target

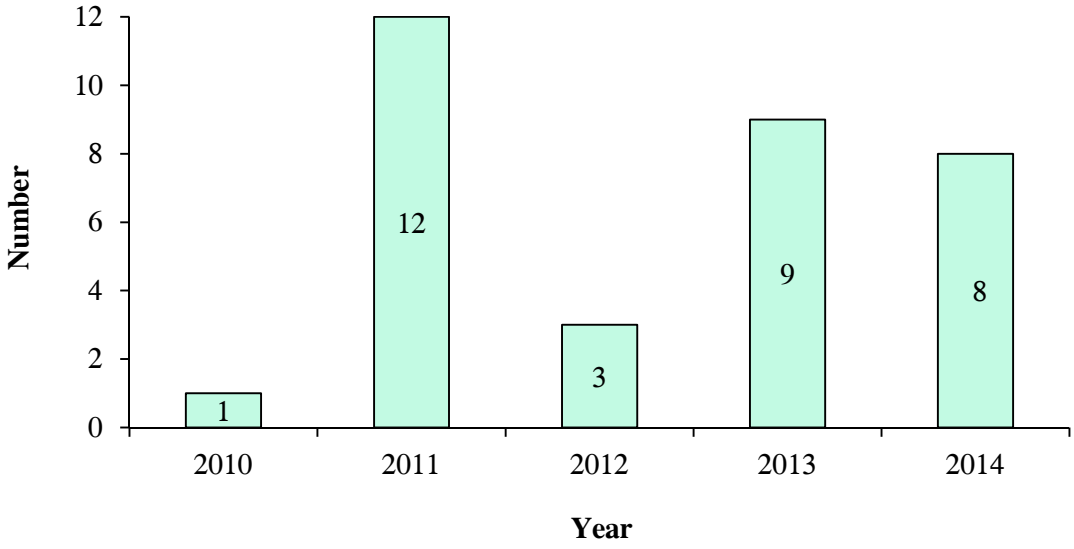
4.3 The GFS's existing operational aircraft comprise two J-41 fixed-wing aircraft, three Super Puma helicopters and four EC155 helicopters. According to the GFS, the Engineering Section aims to ensure all operational aircraft serviceable at 7:00 daily barring scheduled maintenance or any other unforeseen unserviceability. For management reporting purpose, the Engineering Section is committed to making available a minimum of five operational aircraft (one J-41, two Super Pumas and two EC155s) from 7:30 to 23:00, and four operational aircraft (one J-41, one Super Puma and two EC155s) from 23:01 to 7:29 for 95% of the time for each month (i.e. the minimum aircraft availability target). The remaining aircraft will be on standby to meet sudden high operational demand if they are not under maintenance. The Engineering Procedures Manual has specified that not more than one of each type of aircraft will be scheduled for routine maintenance at any one time.

Shortfalls in meeting minimum aircraft availability target

4.4 The Engineering Section reports to the senior management the extent of achievement of the minimum aircraft availability target on a monthly basis. Figure 7 shows that for the five-year period from 2010 to 2014, the shortfalls on aircraft availability against the 95% target totalled 33 (55%) months. Figure 8 shows the extent of achievement of the minimum aircraft availability target.

Figure 7

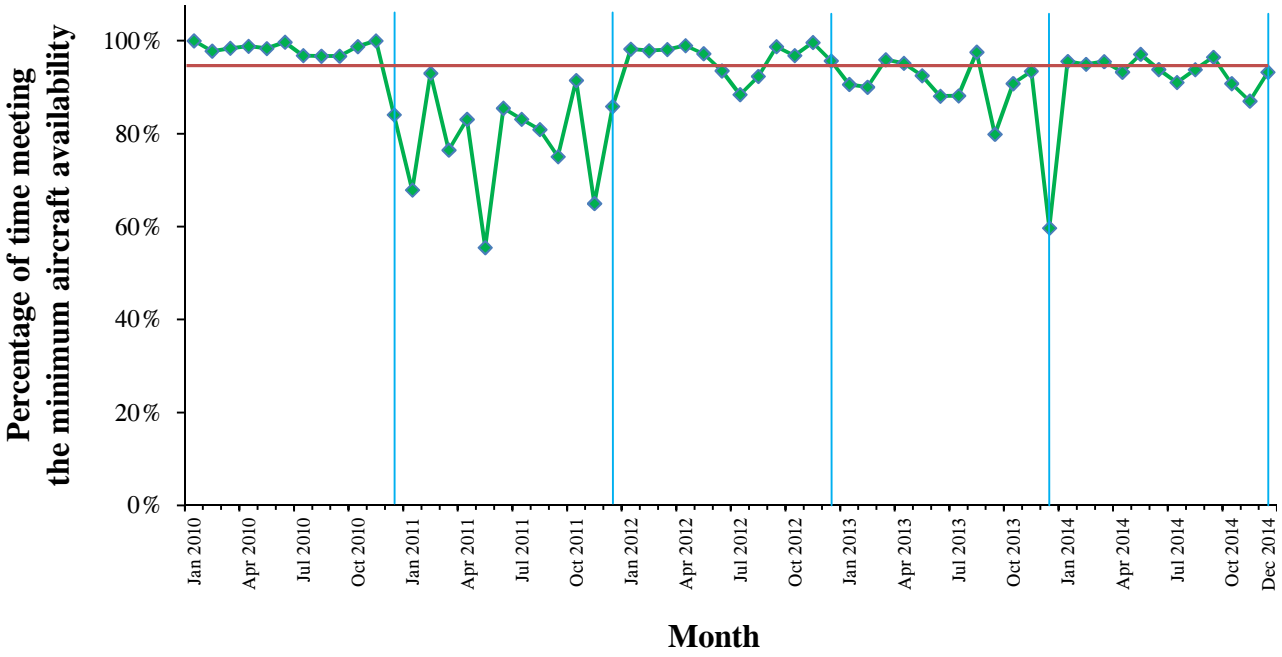
Number of months for which the minimum aircraft availability target was not met (2010 to 2014)



Source: GFS records

Figure 8

Extent of achievement of the minimum aircraft availability target (2010 to 2014)



Legend: 95% minimum aircraft availability target

Source: GFS records

4.5 Audit noted that for 2010 and 2011, the failure to meet the aircraft availability target was mainly caused by an emergency landing accident of a Super Puma helicopter in Shing Mun Reservoir in December 2010. The damaged helicopter was subject to an investigation and major repair for a long period of time. In 2013, the GFS was required to carry out a major structural repair on all three Super Pumas to meet the mandatory airworthiness requirements of the fleet. In 2014, a mandatory 15-year inspection on one Super Puma took three months.

4.6 While the major maintenance work for the Super Puma helicopters was necessary to uphold the reliability and safety of the fleet, the failure to meet the aircraft availability target during long maintenance period was a cause for concern as the provision of emergency services by the GFS could be affected. Case 7 is an example. Audit noted that there were also occasions when the provision of emergency service was affected by insufficient number of serviceable aircraft of other type (i.e. EC155 helicopters). Case 8 is an example.

Case 7

Out-of-pledge case due to insufficient serviceable aircraft

On 5 December 2013, the GFS received a call-out at 13:38 to provide water bombing for fire fighting. At that moment, two of the three Super Puma helicopters were under maintenance, i.e. one routine and the other unscheduled (engine problem reported by the pilot). At 13:45, the only serviceable Super Puma helicopter was also reported by the pilot to have an engine problem. About one hour was spent on identifying and rectifying the problem before flying. As a result, the on-scene time exceeded the performance target of 40 minutes by 90 minutes.

Source: GFS records

Case 8

Declined request for air ambulance service due to insufficient serviceable aircraft

On 28 August 2013, the GFS received a call-out for Type B air ambulance service at 12:26. On that day, one of the four EC155 helicopters was under maintenance and required air test. However, the other three available EC155 helicopters were reported to have technical problems by the pilots after their flying tasks and became unserviceable. As a result, the GFS had to turn down the call-out request. Subsequently, the problems were rectified and the helicopters were gradually returned to service from 14:45 to 16:30.

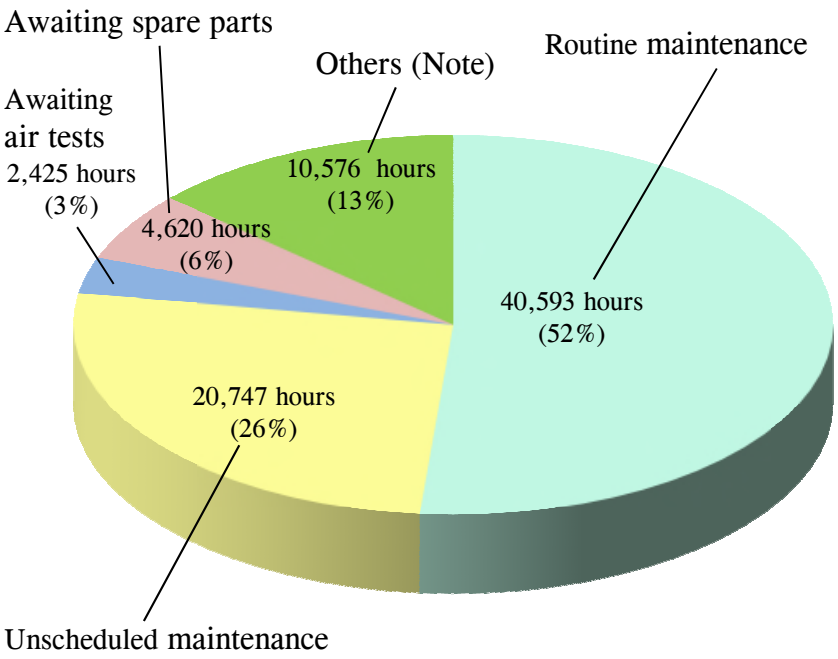
Source: GFS records

Aircraft downtime

4.7 From 2010 to 2014, the downtime of the nine operational aircraft totalled 78,961 hours. Figure 9 is an analysis of contributing factors of the downtime.

Figure 9

Analysis of 78,961 downtime hours of operational aircraft (2010 to 2014)



Source: *GFS records*

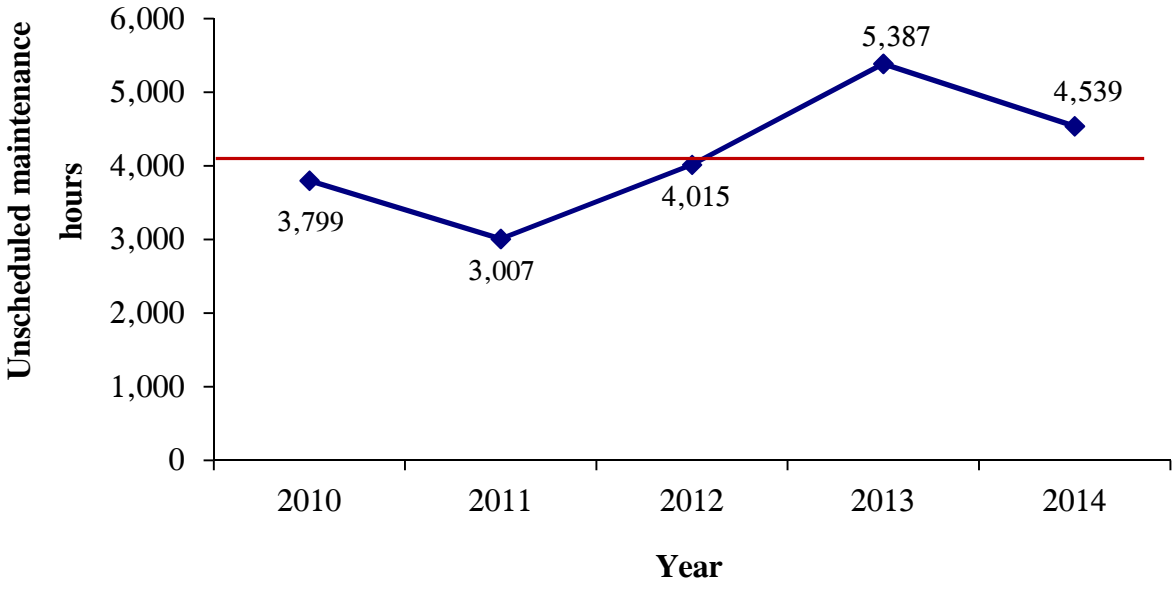
Note: *These included the downtime of 8,827 hours due to the emergency landing accident mentioned in paragraph 4.5. The remaining 1,749 hours included time spent on air tests and deferred air tests due to weather limitations and air traffic control delay.*

Unscheduled maintenance on the rise

4.8 As shown in Figure 9, unscheduled maintenance accounted for 26% of the total downtime (about one half of the routine maintenance hours). Unlike routine maintenance which can be planned (see para. 4.3), unscheduled maintenance cannot be predicted and is more disruptive to day-to-day operations and maintenance planning. Figure 10 shows that from 2010 to 2014, unscheduled maintenance was generally on an increasing trend (i.e. rising to 4,539 hours in 2014 which were higher than the five-year average of 4,149 hours by 9.4%). The situation warrants the GFS management's attention.

Figure 10

Unscheduled maintenance hours of GFS operational aircraft (2010 to 2014)



Legend: — Five-year average of 4,149 hours for 2010 to 2014

Source: GFS records

Aircraft defects reported by pilots

4.9 To ensure that the operational aircraft are serviceable, the Engineering Section performs the following daily inspections on aircraft used for flying duties or on standby:

(a) ***Before the first flight of the day.*** The inspection is to ensure the operational availability of the aircraft for the flights of the day;

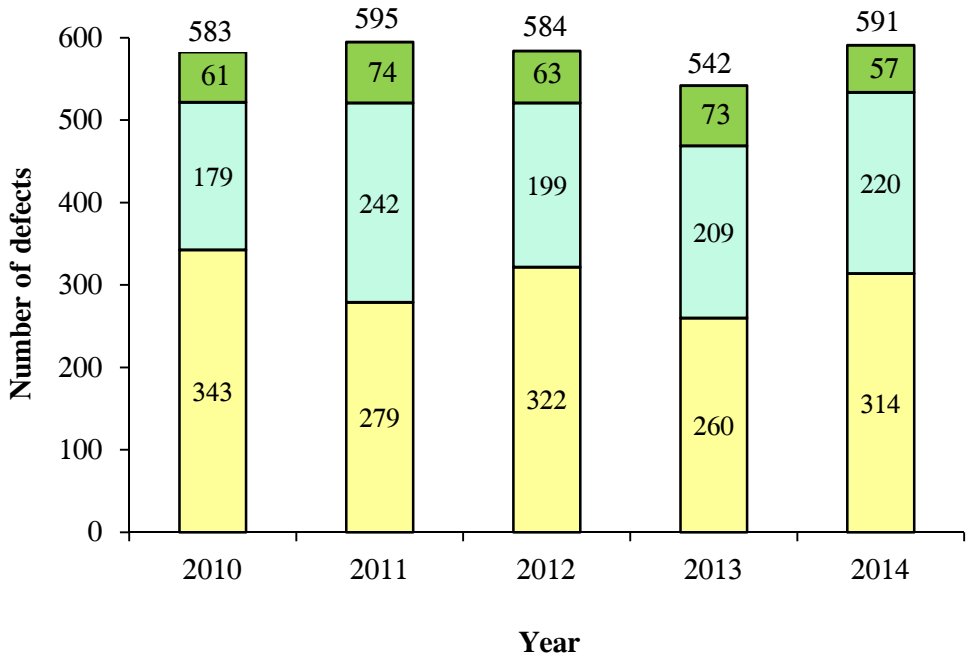
(b) ***Between two flights.*** It is to confirm that the aircraft is immediately serviceable after the previous flight. Any defects reported or identified will be fixed before release for standby; and

(c) ***After the last flight of the day.*** It is to ensure that the aircraft is serviceable for the flights scheduled for the next day.

4.10 From 2010 to 2014, there were a total of 2,895 defects reported by pilots before take-off for flying duties or after airborne. On average, there were about 1.6 defects reported by pilots per day for the serviceable operational aircraft. Figure 11 shows the annual number of defects reported for the Engineering Section's follow-up action.

Figure 11

Aircraft defects reported by pilots
(2010 to 2014)



Source: GFS records

4.11 In 2013, there were 27 out-of-pledge cases of providing emergency services due to unserviceable aircraft (see Figure 2 in para. 2.6). Of these 27 cases, 21 were due to defects reported by pilots before take-off and 6 were due to defects reported after airborne. Case 9 shows an out-of-pledge case in providing Type A+ air ambulance service due to defects identified after airborne. Case 10 is another out-of-pledge case due to defects identified before take-off.

Case 9

Out-of-pledge case due to aircraft defects identified after airborne

On 4 June 2013, the GFS received a call-out at 22:29 for Type A+ air ambulance service (stroke case). The responding helicopter (EC155) was held up by air traffic control until 22:45. After take-off for two minutes (at 22:47), the pilot reported a hydraulic problem of the EC155 and needed to return and change aircraft (Super Puma). Consequently, the on-scene time (23:11) of the Super Puma exceeded the performance target of 20 minutes by 22 minutes.

Source: GFS records

Case 10

Out-of-pledge case due to aircraft defects identified before take-off

1. On 14 June 2013, the GFS received a call-out for Type A air ambulance service at 12:18. However, the responding helicopter (EC155) was reported to have a technical problem (low on hydraulic fluid level) by the pilot before take-off. Additional time was spent on changing helicopter. Finally, the on-scene time (12:47) exceeded the performance target of 20 minutes by 9 minutes.

2. Subsequently, the Engineering Section reviewed the case and reminded relevant staff to pay particular attention to the hydraulic fluid level in the future.

Source: GFS records

4.12 According to the GFS, besides rectifying the reported defects and reviewing the maintenance work with the CAD at monthly meetings, the Engineering Section had also reviewed some of the aircraft defect cases which caused delays in the provision of services for identifying room for improvement in the future maintenance work (see Case 10, and Case 2 in para. 2.24(a)). For 2013 and 2014, the Engineering Section reviewed a total of 53 aircraft defect cases and found that in four cases (7.5%), improvements could be made in the maintenance procedures to prevent recurrence of similar defects. Audit appreciates the GFS's

effort in this regard and considers that the review should cover all the out-of-pledge cases (i.e. the review in 2013 only covered 18 of the 27 out-of-pledge cases while the review in 2014 only covered 26 of the 31 out-of-pledge cases).

Increase in waiting time for air tests

4.13 According to the Policy Statement issued by the Secretary for Security, air tests of aircraft are accorded a high priority of all flying hours (see para. 2.2). However, Figure 9 in paragraph 4.7 shows that the waiting time for air tests still accounted for about 3% of the total downtime.

4.14 Conducting air tests requires suitably qualified pilots. As at December 2014, the GFS had two qualified pilots for conducting air tests for the two fixed-wing aircraft and nine qualified pilots for the seven helicopters (Note 21). In the past five years, waiting time for air tests increased by 271 hours (99%) from 274 hours in 2010 to 545 hours in 2014 (see Table 10). Audit considers that the GFS needs to ascertain the reasons for the increase in waiting time for air tests and take effective measures to address the issue.

Table 10

Waiting time for air tests
(2010 to 2014)

Aircraft	2010	2011	2012	2013	2014
	(Hour)				
Fixed-wing	20	23	—	5	72
Helicopter	254	239	489	848	473
Total	274	262	489	853	545

Source: GFS records

Note 21: *Of the nine pilots qualified for carrying out air tests of helicopters, five were qualified for both the Super Puma and EC155, three for the Super Puma only and one for the EC155 only. These air test pilots were mainly Chief Pilots and Senior Pilots who also carried out other duties (see Note 11 to para. 3.3).*

4.15 In March 2015, in response to Audit's enquiries, the GFS said that:

(a) for safety reasons, air tests could only be conducted during hours of daylight and a large proportion of helicopter air tests must be carried out at a relatively high altitude (3,000 to 6,000 feet) in visual flying conditions;

(b) due to weather, airspace and air traffic control restrictions, suitable conditions were rarely available especially during spring time and typhoon season in summer; and

(c) because of operational priority, there were instances that those air test qualified pilots would be deployed for emergency response. This had a significant effect on the timeliness of helicopter air tests, though the GFS would further review the situation to determine whether improvements could be made to address the issue.

Delays in placing orders for essential spare parts

4.16 Some spare parts are of critical importance for aviation maintenance and enabling an aircraft to return to service. According to the Engineering Procedures Manual, the GFS needs to raise purchase order for such essential spare parts immediately.

4.17 During 2011-12 to 2013-14, the GFS placed 260 orders for the supply of these essential spare parts. Audit examination of these 260 orders revealed that on six occasions (2.3%), it had taken 3 to 15 working days to place orders after receiving suppliers' price quotations (see Table 11). The GFS needs to remind relevant staff to make improvement in this regard.

Table 11

Delays in placing orders for essential spare parts (2011-12 to 2013-14)

Occasion	Aircraft	Quotation received	Order placed	Number of working days between quotation received and order placed
1	Super Puma	12/10/2011	17/10/2011	3
2	Super Puma	24/4/2013	10/5/2013	11
3	Super Puma	6/5/2013	21/5/2013	10
4	Super Puma	7/5/2013	20/5/2013	8
5	J-41	7/2/2013	18/2/2013	4
6	J-41	30/1/2014	24/2/2014	15

Source: Audit analysis of GFS records

Audit recommendations

4.18 **Audit has *recommended* that the Controller, GFS should:**

(a) **continue to review the maintenance planning and endeavour to synchronise as far as possible major repairs and inspections with a view to increasing the availability of serviceable aircraft;**

(b) **continue the efforts to improve the maintenance procedures through reviewing aircraft defect cases;**

(c) **extend the scope of the review of aircraft defect cases to cover all emergency service cases with on-scene time exceeding the pledge;**

(d) **ascertain the reasons for the increase in waiting time for air tests and take effective measures to address the issue; and**

(e) **remind relevant staff to promptly place orders for spare parts essential for servicing the operational aircraft in accordance with the laid-down requirement.**

Response from the Government

4.19 The Controller, GFS generally agrees with the audit recommendations. He has said that the GFS will:

(a) continue its efforts in reviewing maintenance planning and synchronising major repairs and inspections as far as possible without compromising the safety, quality and airworthiness of its fleet;

(b) pay particular attention to the review of reported aircraft defects related to out-of-pledge cases;

(c) look into the arrangements of air tests and take necessary measures to minimise waiting time without compromising the emergency response needs; and

(d) continue to issue regular reminders to the relevant staff for promptly placing orders for spare parts essential for servicing the operational aircraft in accordance with the laid-down requirement.

PART 5: PROCUREMENT OF AIRCRAFT AND SPARE PARTS

5.1 This PART examines the following issues relating to the procurement of aircraft and spare parts by the GFS:

(a) payment issues and low utilisation of training aircraft (paras. 5.2 to 5.18);

(b) delays in delivery of fixed-wing aircraft (paras. 5.19 to 5.28);

(c) replacement of existing helicopters by a single-model fleet (paras. 5.29 to 5.34); and

(d) procurement of spare parts (paras. 5.35 to 5.40).

Payment issues and low utilisation of training aircraft

5.2 In November 2006 and November 2010, the Financial Secretary under delegated authority approved funding of $3.62 million and $7.81 million respectively for the GFS to purchase two training aircraft. Through open tendering, the GFS acquired the following two aircraft:

(a) in June 2008, the Government Logistics Department (GLD) awarded a contract on behalf of the GFS for the supply of a single-engine fixed-wing aircraft (Zlin) at a cost of $3.62 million. Designed for a relatively short flying range under daytime and good weather conditions, Zlin was intended to provide training for pilots within Hong Kong in order to enhance advanced handling skills on extreme flying attitudes (such as stall recovery), confidence and decision making in demanding situations; and

(b) in March 2012, the GLD awarded a contract on behalf of the GFS for the supply of a twin-engine fixed-wing aircraft (Diamond) at a cost of $7.44 million. The twin-engine Diamond allowed training to be conducted at long range and under all weather situations to meet the wide-range training needs of the GFS pilots (including cross country and night flying) so as to better prepare pilots for converting to the new

fixed-wing aircraft (which shares a similar cockpit design concept with the Diamond — see para. 5.19) at a lower training cost and at the same time spare the operational fixed-wing aircraft for mission readiness.

Payment discount not obtained

5.3 According to the Standing Accounting Instructions issued by the Treasury, the officer authorising a payment should check and confirm, and is held responsible for, the accuracy of every detail of the payment authorised. He should ensure, among other things, that where discount terms are applicable, payment discounts should be obtained, as appropriate. In an examination of the payment records for the purchase of the training aircraft Zlin and Diamond, Audit found that payment discount was duly obtained in accordance with the contract terms for Diamond but not for Zlin. The details are as follows:

(a) according to the procurement contract for Zlin, the GFS was entitled to 5% discount for payments made within seven working days from the date of receipt of the invoice or from the date of acceptance of goods whichever was the later. In September 2008 when forwarding the procurement contract to the GFS for retention, the GLD reminded the GFS to take due note of any prompt payment terms offered by the contractor (an overseas limited company hereinafter referred to as Contractor A); and

(b) in June 2009, Contractor A issued an invoice requesting the GFS to effect payment for Zlin. On 29 July 2009, the GFS issued to Contractor A the final acceptance certificate for the aircraft. On 4 August 2009 (four working days later), the GFS made the final payment of $3.62 million to Contractor A. However, the 5% discount (i.e. $181,000) provided for in the contract was not obtained.

5.4 To prevent recurrence of similar problem, the GFS needs to tighten internal control to ensure that the Standing Accounting Instructions requirements on payment control are always complied with.

Write-off of advance payments for undelivered spare parts

5.5 From November 2008 to May 2009, the GFS placed nine purchase orders with Contractor A for the supply of spare parts at a total cost of $762,600. At the request of Contractor A and having considered that Contractor A was the manufacturer of Zlin, the GFS made advance payments for all these orders. With the exception of five orders (totalling $79,410), Contractor A failed to fully deliver the spare parts for the remaining four orders (totalling $683,190).

5.6 For the four outstanding orders, the GFS received on 14 May 2009 about one quarter by value (i.e. $60,100 out of $229,110) of the spare parts for the first order. No more spare parts had been received since then. Subsequently, the GFS made advance payments for the three remaining orders ($15,130 on 15 May 2009, $2,300 on 20 May 2009 and $436,650 on 21 July 2009). On 22 July 2009, the former sales representative of Contractor A informed the GFS that Contractor A's production programme had been taken over by a new company (Company B). From that point onwards, the GFS tried but in vain to press Contractor A and Company B for the delivery of the outstanding spare parts.

5.7 In September 2010, the legal representative of Company B informed the GFS that Contractor A was in bankruptcy and Company B would not undertake any obligation of Contractor A. Thereafter, the GFS tried again to request Company B to deliver the outstanding spare parts but to no avail. In 2012, the GFS sought advice from the Department of Justice (DoJ) and the relevant Consulate (of Contractor A's country of incorporation). Both of them informed the GFS that a proof of debt should have been filed in time with the liquidator who would discharge any debt if Contractor A had any assets to do so. However, the deadline for filing of debts expired in 2010. In February 2014, in response to the Financial Services and the Treasury Bureau's enquiries, the GFS said that it had not consulted any party the risk of agreeing to advance payment because there were no government regulations/guidelines in this regard. In June 2014, with the approval of the Financial Services and the Treasury Bureau, the GFS wrote off the irrecoverable amount of $550,760 (Note 22).

Note 22: *The irrecoverable amount was arrived at by deducting from the total prepayment of the four outstanding orders ($683,190), the value of spare parts received ($60,100) and the deposit ($72,330) under the procurement contract for Zlin which the Government had exercised the contractual right of deduction for setting off any sum due to the Government.*

5.8 To prevent recurrence of similar loss, in January 2014 the GFS informed the Financial Services and the Treasury Bureau that it had issued instructions requiring all advance payments to be approved by the Departmental Stores Manager (Note 23) (except six categories of goods/services — Note 24). Audit noted that in June 2012, the DoJ advised the GFS of the good practice in contracting with overseas contractors, i.e. securing a foreign legal letter so that the Government would know the legal position as to the incorporation of the overseas company, its ability and capability to enter into contract and any problem with the enforceability in case recovery action is necessary.

5.9 In Audit's view, the GFS should also issue instructions requiring relevant staff to follow the DoJ's advice on ways to protect the Government's interest in contracting with an overseas company and in the event of a bankrupt contractor (see paras. 5.7 and 5.8). To enable other B/Ds to learn from this case, the Treasury and the GLD need to consider issuing guidelines promulgating the good practices in handling advance payments particularly in respect of overseas contractors.

Low utilisation of the two training aircraft

5.10 In 2007 when planning for the purchase of the training aircraft Zlin, the GFS estimated that Zlin would be operated for about 200 flying hours per year. However, Audit found that since the commissioning of Zlin in 2009, its flying hours were consistently below the estimate and had decreased from 138 in 2010 to 61 in 2014.

5.11 In June 2011, in an information note on the procurement of aircraft for the GFS, the Government informed the FC that the twin-engine training aircraft (Diamond) to be procured would increase the availability of the operational aircraft (J-41s) for responding to emergency call-outs by minimising the use of operational aircraft for training purpose. In February 2012 during the tendering stage of the training aircraft Diamond, the GFS informed the GLD that Diamond would be

---

Note 23: *The Departmental Stores Manager is responsible for supervising all procurement and stores management matters within the GFS.*

Note 24: *The six categories include subscription of periodicals, telephone line rental charges, Internet service charges, pager/mobile phone charges, annual office equipment maintenance charges and training/conference fees.*

operated for at least 500 hours per year. However, Audit found that the actual flying hours of Diamond were 108 in 2013 and 90 in 2014, well below the estimated 500 hours per year. On the other hand, the use of the operational aircraft J-41s for training had not decreased, i.e. 1,299 hours in 2013 and 2014 which were comparable to 1,200 hours in 2011 and 2012.

5.12 Between December 2014 and February 2015, in response to Audit's enquiries, the GFS said that:

(a) the low utilisation of Zlin was mainly due to the reduced number of target trainees in these years, i.e. two such pilots were on operational detachment (one for 11 months and the other for 12 months). Two Cadet Pilots failed during training and left the GFS (one in 2009 and the other in 2012). The resignation of two trainers (one in 2010 and the other in 2012) was another contributing factor;

(b) as for Diamond, it was intended to be a training plane for the two new fixed-wing operational aircraft which were originally planned to be commissioned in 2013 (see para. 5.19(d)) because both types of aircraft had similar cockpit design concept. Due to the delay in delivery of the new fixed-wing operational aircraft, training use of Diamond was lower than expected;

(c) in recent years, the availability of suitable take-off and landing slots for the GFS at the Hong Kong International Airport and Shek Kong Airfield had decreased due to an increase in demand for airspace, and the rapid increase in the number of residential development in the vicinity of Shek Kong; and

(d) maintenance priority placed on operational aircraft also contributed to the low utilisation of both training aircraft. In the case of Zlin, there was a shortage of spare parts (see para. 5.5) and in the case of Diamond, there had been a process for the GFS pilots and engineers to familiarise themselves with the new aircraft.

Long downtime of the two training aircraft

5.13 Audit examination of the serviceability reports of the two training aircraft revealed that both aircraft had experienced long downtime in addition to their low utilisation (see Table 12). In particular, Zlin had been out of service since September 2014.

Table 12

Downtime and flying hours of training aircraft (2010 to 2014)

Aircraft	2010	2011	2012	2013	2014
Zlin					
Downtime (Hour)	4,036	507	1,760	195	3,962
Flying hours	138	108	71	69	61
Diamond					
Downtime (Hour)	Not applicable (Note)			1,797	2,603
Flying hours				108	90

Source: Audit analysis of GFS data

Note: The training aircraft Diamond was put into use in February 2013.

5.14 Audit considers that the GFS needs to review the downtime of the two training aircraft with a view to identifying effective ways to improve their serviceability for supporting the training of fixed-wing pilots.

Audit recommendations

5.15 **Audit has *recommended* that the Controller, GFS should:**

(a) **tighten internal control to ensure that the Standing Accounting Instructions requirements on payment control are always complied with;**

(b) **establish procedures for relevant staff responsible for procurement of aircraft and equipment on ways to protect the Government's interest in contracting with an overseas company and in the event of a bankrupt contractor; and**

(c) **review the downtime of the two training aircraft with a view to identifying effective ways to improve their serviceability for supporting the training of fixed-wing pilots.**

5.16 **Audit has *recommended* that the Director of Accounting Services and the Director of Government Logistics should consider issuing guidelines promulgating the good practices in handling advance payments particularly in respect of overseas contractors**.

Response from the Government

5.17 The Controller, GFS generally agrees with the audit recommendations in paragraph 5.15. He has said that the GFS:

(a) has reminded all relevant staff of the Standing Accounting Instructions requirements on payment control. It will continue to take measures to ensure tight control in this regard;

(b) will, in consultation with the GLD, work out appropriate procedures to safeguard the Government's interest in contracting with an overseas company and in the event of a bankrupt contractor; and

(c) will review and take measures to improve the serviceability of the two training aircraft.

5.18 The Director of Accounting Services and the Director of Government Logistics agree with the audit recommendation in paragraph 5.16.

Delays in delivery of fixed-wing aircraft

5.19 In June 2009, the GFS obtained the FC's funding approval of $776 million to replace the two fixed-wing aircraft and the associated mission equipment. The FC (Note 25) was then informed that:

(a) the existing J-41s were approaching the end of their serviceable life. The aircraft manufacturer had ceased production of J-41. As a result, the level of technical support available from the manufacturer and spares suppliers had been on a gradual decline. The GFS estimated that its stock of essential spare parts for the J-41s would be depleted in about four years;

(b) the mission equipment installed on the two J-41s had been in use since the aircraft came into service in 1999. Most of the equipment had become obsolete and the production of some spare parts had already ceased;

(c) the GFS conducted a market research on possible replacement for J-41s and the associated mission equipment. The research indicated that it would take approximately three years to build and modify an aircraft to the standards required for its operations; and

(d) according to the GFS implementation plan, award of contract for the supply for the new aircraft was targeted for December 2010 and the new aircraft were expected to be commissioned in March 2013.

5.20 In August 2011, the GLD awarded a contract on behalf of the GFS at a sum of $748.1 million (Note 26) for the supply of the two fixed-wing aircraft. The contract delivery dates of the two aircraft were scheduled for November 2013 and

---

Note 25: *The Legislative Council Panel on Security was also advised of the same at its meeting held on 5 May 2009.*

Note 26: *In 2012 and 2013, the GFS obtained the GLD Tender Board's approval to implement enhancements to the aircraft through two contract variations which together increased the contract sum by $10.2 million to $758.3 million (see Appendix C). According to the GFS, the variations had no impact on the aircraft delivery schedule. Up to February 2015, the accumulated expenditure for this replacement project was $563.3 million.*

January 2014 (instead of March 2013 as stated in the FC paper). According to the GFS, as the commercial and legal terms of the tender were far more complicated than anticipated, it took a longer time to prepare the tender requirements/specifications. As a result, the award of contract was eight months later than planned (see para. 5.19(d)).

5.21 ***Modification work of the new aircraft on order.*** Since the award of contract in August 2011, the GFS had held weekly tele-conferencing progress meetings with the contractor (hereinafter referred to as Contractor C) to monitor the progress. According to the contract, besides supplying the aircraft, Contractor C was required to modify the aircraft in order to install and certify various mission equipment. One of the mission equipment items to be installed was the digital aerial camera of the Lands Department which would be used for the provision of aerial photograph services for all B/Ds (Note 27). Contractor C was required to install the aerial camera and provide an optical glass window in the fuselage belly through which the camera could take pictures in a pressurised cabin. Contractor C was also required to provide a sliding cover to protect the glass window not in use. In 2012, the GFS and Contractor C discussed the outstanding matters of the aerial camera and the modification work through meetings and exchange of correspondence.

5.22 ***Failed flight tests of the new aircraft on order.*** According to the contract, Contractor C should conduct a series of certification flight tests for the first aircraft in May 2013 and complete all the tests within 125 days (i.e. in October 2013). However, the aircraft failed the flight test conducted in August 2013 due to flying stability problems related to the camera sliding cover (see para. 5.21). At a progress review meeting held in September 2013, Contractor C informed the GFS that the contracted delivery of the aircraft would be deferred from mid-November 2013 (by five months) to early April 2014. Since then, the GFS had issued regular reminders to Contractor C to follow up the modification work for the camera sliding cover and sought legal advice on handling the delay issue. In July 2014, the aircraft failed the second flight test. In November 2014, the aircraft passed some milestone flight tests. However, there were still other tests of the aircraft and mission equipment to be carried out in accordance with the contract terms. In December 2014, Contractor C informed the GFS that the expected

---

Note 27: *In May 2011, the Lands Department obtained the FC's funding approval of $41.6 million to replace its aged film-based aerial camera by a digital aerial camera for installation in the GFS's new fixed-wing aircraft.*

delivery date of the first aircraft would be late 2015 (i.e. 33 months later than March 2013 as stated in the FC paper).

5.23 ***Expected benefits not yet realised.*** Due to the delays in the delivery of the new aircraft, the following expected benefits (as stated in the FC paper) could not be realised in the interim:

(a) because of their faster speed and longer endurance (Note 28), the new aircraft would reach the scene of the incident much quicker and remain on scene for longer and more thorough search. This was expected to increase the chance of locating survivors, reduce their exposure time in a hostile environment and increase their chance of survival;

(b) the meteorological data collected by the new aircraft for the Hong Kong Observatory's analysis of wind shear and turbulence would be of high reference value to the airlines using the Hong Kong International Airport; and

(c) the mission equipment to be installed on the new aircraft would greatly improve the GFS's operational efficiency and enhance flight safety. For example, the integration of the forward looking infrared detection system with the global positioning system of the new aircraft would allow the pilot to locate the exact position of the target more speedily (e.g. a vessel in distress). This would enhance the chance of success of search and rescue operations.

5.24 ***Difficulties in maintaining existing aircraft.*** Audit noted that there were difficulties in maintaining the serviceability of the ageing J-41s and their mission equipment:

(a) the total downtime of the two J-41s had increased from 1,704 hours in 2012 to 3,187 hours in 2014. In 2013, there were two consecutive days on which both J-41s were not serviceable;

Note 28: *The speed and maximum range of the J-41 were 220 nautical miles per hour and 1,600 nautical miles respectively while those of the new aircraft were 430 nautical miles per hour and 3,900 nautical miles respectively.*

(b) the only spare weather radar system and spare engine for J-41s had become unserviceable since April 2013 and November 2014 respectively. There is a risk that the J-41s may have to be grounded if there is any problem with their engine or weather radar system on board; and

(c) the infrared detection system of one of the J-41s had become unserviceable since December 2014 leaving one such system available for operations. The system was important for the pilot to locate the exact position of the target more speedily (e.g. a vessel in distress).

5.25 In Audit's view, the GFS needs to:

(a) closely monitor the outstanding contract work for the supply of the two new fixed-wing aircraft to ensure that greatest efforts are being made to expedite delivery of the aircraft;

(b) step up maintenance efforts for the existing J-41s and their mission equipment to ensure a reliable fixed-wing flying service; and

(c) learn from the experience of this case as the new helicopters (see para. 5.31) now under purchase also have to undergo modification work to accommodate essential mission equipment.

5.26 ***Information for Legislative Council.*** In 2009 when seeking funding of $776 million for replacing the existing fixed-wing aircraft J-41s which were approaching the end of their serviceable life, the GFS informed the Legislative Council Panel on Security and the FC that the new aircraft would be commissioned in March 2013. In April 2014 (in response to Members' questions), the GFS informed the FC that the delivery of the two new aircraft had been delayed because of an unforeseen flying stability issue. As at February 2015 (after a delay of almost two years), the new aircraft had not yet completed all the contract required tests and the delivery date of the first aircraft was estimated to be late 2015. For public accountability, the GFS needs to keep the FC and relevant Legislative Council Panels informed of the progress in implementing major procurement projects which have experienced significant delays.

Audit recommendations

5.27 **Audit has *recommended* that the Controller, GFS should:**

(a) **closely monitor the outstanding contract work for the supply of the two new fixed-wing aircraft to ensure that greatest efforts are being made to expedite delivery of the aircraft;**

(b) **step up maintenance efforts for the existing J-41s and their mission equipment to ensure a reliable fixed-wing flying service;**

(c) **closely monitor and manage the procurement project of the new helicopters, especially the modification work for installing essential mission equipment, in the light of the experience of the delays in the delivery of the two new fixed-wing aircraft; and**

(d) **for public accountability, keep the FC and relevant Legislative Council Panels informed of the progress in implementing major procurement projects which have experienced significant delays.**

Response from the Government

5.28 The Controller, GFS generally agrees with the audit recommendations. He has said that the GFS will:

(a) continue to make its best efforts in monitoring the outstanding contract work and expediting the delivery of the new aircraft;

(b) continue its on-going maintenance efforts for the existing J-41s and their mission equipment;

(c) take steps to ensure that the modification work planned for the new helicopter fleet will be closely monitored and managed; and

(d) keep the FC and relevant Legislative Council Panels informed of the progress of the aircraft procurement projects when appropriate.

Replacement of existing helicopters by a single-model fleet

5.29 In May 2013, the GFS consulted the Legislative Council Panel on Security on its plan to replace the existing two-model helicopter fleet by a single-model fleet. The GFS informed the Panel that a single-model medium-sized helicopter fleet would better meet its operational needs, as follows:

(a) ***Improving flight safety.*** A single-model helicopter fleet would allow uniformity in operational procedures, hence enhancing flight safety;

(b) ***Raising operational efficiency.*** The new helicopters could be installed with various kinds of mission equipment, enabling the GFS to deploy them for responding to emergency incidents with greater flexibility, effectiveness and efficiency, especially when a number of different emergency call-out requests were received simultaneously;

(c) ***Improving overall disaster response and counter-terrorist capabilities of Hong Kong.*** As all the new helicopters could be installed with various kinds of mission equipment, the GFS would be able to deploy more aircraft at any one time for providing different disaster relief, and search and rescue operations, such as large-scale maritime or air accidents. The fleet would also allow greater flexibility in responding to different counter-terrorist and law enforcement operations, and would better serve the operational needs of the HKPF in promptly responding to potential threats;

(d) ***Increasing cost-effectiveness.*** Given the synergy effect, a single-model helicopter fleet would require stocking fewer spare parts, tools and equipment than a two-model helicopter fleet (which would require different approved tools and equipment for repairing different aircraft models), resulting in a more effective use of resources; and

(e) ***Enhancing training.*** As flight crew and engineering staff would only need to familiarise themselves with the operation of one helicopter model, the training could be more focused on enhancing service quality and safety level. This would improve operational efficiency and cost-effectiveness.

Risk of a single-model fleet

5.30 In response to a Legislative Council Panel Member's question on whether the new fleet comprising one model would come to a halt with any suspension of operation of the model arising from manufacturing defects, the Security Bureau said that one of the helicopters (EC155s) would be retained as backup. In addition, the fixed-wing aircraft could also assist in operations by coordinating with other surface vessels in the vicinity to provide rescue service.

5.31 In June 2013, the GFS obtained the FC's funding approval of $2,187.5 million to replace the existing two-model helicopter fleet by a single-model fleet. In response to a FC Member's question on whether the Government would consider maintaining two EC155s as backup, the Security Bureau said that:

(a) one EC155 would ensure that the emergency service could be maintained in case the new helicopters could not be deployed due to failure or reported failure of the same type of helicopters by other operators. The GFS could deploy the fixed-wing aircraft for search and rescue operations; and

(b) the EC155 would remain in the fleet for about four to five years after the new fleet was commissioned. The Government would then assess the operational needs for keeping the EC155 further.

As at February 2015, tendering for the supply of the helicopters was in progress.

5.32 Audit noted that from 2009 to 2014, there were three occasions on which either all the Super Pumas or all the EC155s had to be suspended from service (see Table 13). Similar incidents with a single-model helicopter fleet in future could mean a full-scale suspension of some emergency services (such as air ambulance service and rescue operation by winching which cannot be provided by fixed-wing aircraft). In March 2015, in response to Audit's enquiries, the GFS said that:

(a) it had assessed the risk of using a single model before submitting the FC paper and considered that the added benefits of single model far outweighed the risks; and

(b) as reported to the FC in 2013, the EC155 would be used as backup for about four to five years after the new fleet was commissioned.

However, Audit noted that the backup EC155 would reach the end of its service lifespan after 2017 (see para. 1.6). In Audit's view, the GFS needs to review the adequacy of the contingency plan and make refinement where appropriate.

Table 13

Suspension of specific type of helicopters from service (2009 to 2014)

Helicopter	Date	Number of days affected	Reason
Super Puma	18 to 21 April 2009	4	An overseas Super Puma crashed into the North Sea with no survivors on 1 April 2009. The accident was caused by the main gearbox problem. Mandatory inspection was conducted on all the GFS's Super Pumas.
	28 to 31 December 2010	4	A GFS's Super Puma needed emergency landing in Shing Mun Reservoir due to main gearbox problem. All three Super Pumas were inspected.
EC155	28 and 29 August 2013	1	Main gearbox problem of an EC155 was reported by a pilot at 17:22 on 28 August 2013. As a safety measure, all four EC155s were inspected and three were back to service at 16:00 on 29 August 2013.

Source: GFS records

Audit recommendation

5.33 **Audit has *recommended* that the Controller, GFS should review the adequacy of the contingency plan for the new single-model helicopter fleet in the event of manufacturing defects or reported failure and make refinement where appropriate.**

Response from the Government

5.34 The Controller, GFS generally agrees with the audit recommendation.

Procurement of spare parts

5.35 In connection with the acquisition of new aircraft, the GFS usually has to stock up sufficient spare parts for maintenance purposes. For the two aircraft replacement exercises now underway, the following provisions were made for the purchase of initial batch of spare parts and tools:

(a) ***New fixed-wing aircraft.*** An amount of $43 million was earmarked for the purchase of initial batch of spare parts and tools, representing 16% of the capital cost of the aircraft of $266 million; and

(b) ***New helicopters.*** An amount of $119.7 million was earmarked for the purchase of initial batch of spare parts and tools, representing 8% of the capital cost of the aircraft of $1,456 million.

Excessive spare parts for training aircraft Diamond

5.36 As for the two training aircraft, the following expenditure had been incurred for the purchase of initial batch of spare parts and tools since their acquisition:

(a) ***Zlin.*** About $0.4 million had been spent on spare parts, representing 11% of the capital cost of the aircraft of $3.62 million; and

(b) ***Diamond.*** About $4.6 million had been spent on spare parts, representing 62% of the capital cost of the aircraft of $7.44 million.

5.37 In view of the disproportionally higher expenditure on spare parts for the training aircraft Diamond than those of other aircraft, Audit sample checked the high-valued items and found that two sets each of the following spare parts were purchased for Diamond:

(a) one aircraft engine was purchased in November 2012 and another one in February 2013 (each costing about $0.6 million);

(b) two sets of multi-function and primary flight display (each costing $0.16 million) were purchased in March 2013; and

(c) two transceivers (each costing $80,000) were purchased in March 2013.

5.38 However, Audit noted that for the two existing operational J-41 aircraft, only one spare engine was stocked. The stocking of two engines for one training aircraft Diamond appears to be excessive. It is also undesirable to purchase similar items with limited warranty period or shelf life within a short time. For example, the 12-month warranty periods of both transceivers had expired in March 2014. Similarly the 30-month warranty periods of the two spare engines would expire in September 2015 and January 2016 respectively. The GFS needs to conduct a review of the stock level of spare parts for Diamond with a view to identifying room for improvement in stock management.

Audit recommendations

5.39 **Audit has *recommended* that the Controller, GFS should:**

(a) **place orders by phases for spare parts with limited warranty period or shelf life; and**

(b) **review the stock level of spare parts for the training aircraft Diamond with a view to identifying room for improvement in stock management.**

Response from the Government

5.40 The Controller, GFS generally agrees with the audit recommendations. He has said that the GFS will:

(a) exercise prudence in ordering aircraft spare parts in the future without compromising the airworthiness of the aircraft and the operations of the GFS; and

(b) continue its review of the stock level of the spare parts for the training aircraft Diamond.

PART 6: WAY FORWARD

6.1 This PART outlines the major audit observations and examines the way forward.

Major audit observations

6.2 The GFS has a multi-role mission. As an emergency response department, it is required to provide round-the-clock search and rescue, and air ambulance service. At the same time, it has to provide a wide range of flying services to support the work of other B/Ds. From 2010 to 2014, the flying services in terms of flying hours provided by the GFS had increased by 18%. The increasing demands for the GFS flying services put a great strain on its limited resources.

6.3 The GFS reported in its CORs that on average, six (26%) of the 23 on-scene time targets for some emergency services could not be met each year from 2010 to 2014. In PART 2, Audit found that unavailable aircraft and crew members accounted for 22% of the out-of-pledge cases. There were inadequacies in reporting out-of-pledge and multiple call-out cases in the CORs. After making adjustments for these cases, the total number of on-scene time targets not met for the five years from 2010 to 2014 totalled 49 (averaging 9.8 per year) instead of 30 (averaging six per year) as reported by the GFS in the CORs. Audit also found that from 2010 to 2014, the GFS declined a total of 852 service requests after examining relevant factors such as the urgency, weather conditions, availability of air assets and tasking priority. The GFS had not duly taken into account these declined cases when reporting its response rates to flying services in the CORs.

6.4 The GFS has to roster its aircrew to work in three shifts on a daily basis in order to provide emergency response on a 24-hour basis year-round. In PART 3, Audit found that of the 4,142 shifts arranged in 2013 and 2014, 178 (4.3%) were insufficiently manned. As a result, some emergency call-out cases were delayed or declined. Audit also found that for three of the five years from 2010 to 2014, there were more occasions of extension of flying/duty hours of the aircrew and reduction of their rest time than targeted.

6.5 The GFS's Engineering Section is committed to achieving the minimum aircraft availability target. In PART 4, Audit found that there were shortfalls on aircraft availability against the target in 33 (55%) months during 2010 to 2014. There were occasions where the call-out cases had been declined or delayed due to insufficient serviceable helicopters. From 2010 to 2014, the downtime of the nine operational aircraft totalled 78,961 hours, of which 26% were due to unscheduled maintenance. Unscheduled maintenance is disruptive to day-to-day operations and maintenance planning. The increasing trend in unscheduled maintenance hours from 2010 to 2014 warrants the management's attention. From 2010 to 2014, there were a total of 2,895 aircraft defects reported by pilots before take-off for flying duties or after airborne. The GFS needs to continue its efforts to improve the maintenance procedures through reviewing aircraft defect cases.

6.6 In PART 5, Audit found that the utilisation of the two training aircraft was lower than expected due to the reduced number of target trainees and resignation of some trainers. Even though the two aircraft had low utilisation, both aircraft had experienced long downtime. For the fixed-wing aircraft replacement exercise currently underway, there were technical problems in the flight tests. The expected delivery date of the first new aircraft would be late 2015, i.e. 33 months later than the target commissioning date of March 2013 as stated in the FC paper. As a result, the expected benefits of the new aircraft to enhance the GFS's operational efficiency and flight safety could not be realised in the interim. Meanwhile, there were difficulties in maintaining the existing ageing fixed-wing aircraft. For the single-model helicopter fleet currently under purchase, the GFS needs to review the adequacy of the contingency plan in the event of manufacturing defects or reported failure and make refinement where appropriate.

Recent development

6.7 In November 2014, the GFS obtained funding from the Security Bureau for 2015-16 to commission a consultancy study on how well and sustainable the GFS's manpower and structure could support its mission, objectives and needs in the short, medium and long terms. In Audit's view, in conducting the study, the GFS needs to take on board the audit findings and recommendations in this Audit Report.

Audit recommendation

6.8 **Audit has *recommended* that the Controller, GFS should, in conducting the consultancy study of the GFS's manpower and structure, take on board the audit findings and recommendations in this Audit Report.**

Response from the Government

6.9 The Controller, GFS generally agrees with the audit recommendation and will suitably take on board the findings and recommendations in this Audit Report in future studies.

Appendix A
(para. 2.4 refers)

Performance of flying services provided by the Government Flying Service (2010 to 2014)

	Call-out for flying services	Pledged on-scene time (Minute)	Target (%)	Actual				
				2010 (%)	2011 (%)	2012 (%)	2013 (%)	2014 (%)
Air ambulance service								
1	Type A+ and A casualty evacuation situations within Island Zone	20	90	95	**89**	**86**	**87**	**87**
2	Type A+ and A casualty evacuation situations outside Island Zone	30	90	N.A.	N.A.	N.A.	N.A.	N.A.
3	Type B casualty evacuation	120	100	**99**	100	**99**	100	**99**
Inshore search and rescue by helicopter								
4	Between 7:00 and 21:59	40	90	97	96	95	96	96
5	Between 22:00 and 6:59 where additional crew/specialised equipment not required	40	90	**83**	**67**	**79**	**78**	**76**
6	Between 22:00 and 6:59 where additional crew/specialised equipment required	100	90	**50**	100	100	100	100
Offshore search and rescue by helicopter								
7	Between 7:00 and 21:59 and less than 92.5 km from GFS Headquarters	60	90	N.A.	100	100	N.A.	100
8	Between 7:00 and 21:59 and 92.5 km to 370 km from GFS Headquarters	60 for the 1st 92.5 km plus 30 per an extra 92.5 km	90	N.A.	N.A.	N.A.	100	N.A.
9	Between 22:00 and 6:59 and less than 92.5 km from GFS Headquarters	120	90	100	100	N.A.	100	100
10	Between 22:00 and 6:59 and 92.5 km to 370 km from GFS Headquarters	120 for the 1st 92.5 km plus 30 per an extra 92.5 km	90	100	**50**	N.A.	N.A.	N.A.

Appendix A
(Cont'd)
(para. 2.4 refers)

	Call-out for flying services	Pledged on-scene time (Minute)	Target (%)	Actual 2010 (%)	2011 (%)	2012 (%)	2013 (%)	2014 (%)
Search and rescue by fixed-wing aircraft								
11	Between 7:00 and 21:59 and less than 92.5 km from GFS Headquarters	50	90	100	100	100	100	100
12	Between 7:00 and 21:59 and 92.5 km to 185 km from GFS Headquarters	65	90	**88**	100	100	100	100
13	Between 7:00 and 21:59 and beyond 185 km from GFS Headquarters	65 for the 1st 185 km plus 15 per an extra 92.5 km	90	93	100	**86**	**80**	**78**
14	Between 22:00 and 6:59 and less than 92.5 km from GFS Headquarters	110	90	N.A.	100	100	100	N.A.
15	Between 22:00 and 6:59 and 92.5 km to 185 km from GFS Headquarters	125	90	100	100	100	100	N.A.
16	Between 22:00 and 6:59 and beyond 185 km from GFS Headquarters	125 for the 1st 185 km plus 15 per an extra 92.5 km	90	100	100	100	100	**80**
Law enforcement								
17	Island Zone where additional crew/specialised equipment not required	20	90	98	100	100	99	100
18	Island Zone where additional crew/specialised equipment required	80	90	N.A.	N.A.	N.A.	N.A.	100
19	Outside Island Zone where additional crew/specialised equipment not required	30	90	**79**	**73**	**83**	**76**	**80**
20	Outside Island Zone where additional crew/specialised equipment required	90	90	100	N.A.	N.A.	N.A.	N.A.

Appendix A
(Cont'd)
(para. 2.4 refers)

Call-out for flying services		Pledged on-scene time (Minute)	Target (%)	Actual				
				2010 (%)	2011 (%)	2012 (%)	2013 (%)	2014 (%)
Fire fighting								
21	Water bombing	40	85	**74**	**72**	**76**	**65**	**74**
22	Trooping where additional crew/ specialised equipment not required	40	85	100	100	N.A.	**50**	100
23	Trooping where additional crew/ specialised equipment required	100	85	N.A.	N.A.	N.A.	N.A.	N.A.
Number of flying services not meeting performance targets				6	5	6	6	7

Source: *GFS's CORs*

Remarks: *Actual performance figures not meeting the on-scene time targets are shown in bold.*

Appendix B
(para. 3.3 refers)

Establishment and strength of pilot and air crewman officer grades (31 December 2014)

Grade	Establishment	Strength	Number of vacancies
Pilot			
Chief Pilot	2	2	—
Senior Pilot	10	9	1
Pilot I	16	12	4
Pilot II	13	11	2
Cadet Pilot	2	3 (Note 1)	—
Total	43	37	6 (Note 2)
Air crewman officer			
Senior Air Crewman Officer	1	1	—
Air Crewman Officer I	4	4	—
Air Crewman Officer II	6	6	—
Air Crewman Officer III	22	20	2
Total	33	31	2

Source: GFS records

Note 1: The establishment of Cadet Pilot was two. The GFS created one supernumerary post, which was held against a vacant post in the Pilot II rank to accommodate one Cadet Pilot for temporary purposes.

Note 2: Two newly recruited Cadet Pilots will report duty in 2015.

Appendix C
(Note 26 to
para. 5.20 refers)

Summary of two contract variations in the procurement of the two fixed-wing aircraft

Contract variation 1

1. In April 2012, the GFS obtained the GLD Tender Board's approval to acquire the following enhancements to the two new aircraft at a cost of $4.7 million by way of a contract variation:

(a) a cockpit touch screen to provide electronic database manual for easy access to the flight and maintenance manuals during flight;

(b) two additional forward facing seats for each aircraft to increase the seating capacity from four to six;

(c) integrated headrests to improve occupational safety of the aircrews;

(d) a removable partition wall system for medical evacuation missions. The system would provide a better sealing off for the cabin entry door which was important for maintaining a constant temperature and humidity environment for the cabin area. The system could be removed to reduce the risk of damaging the cabin interior when loading and unloading medical equipment; and

(e) an additional antenna to extend the range for reception and transmission of signal.

2. According to the GFS, the reasons for the enhancements were:

(a) the technical requirements specified in the tender document represented the minimum requirements of the GFS in order to enhance the competition of the tendering exercise. After the award of contract, the GFS reviewed the specifications of the aircraft and identified the possibilities of the above-mentioned enhancements to improve the flight and cabin safety, and the operational efficiency of the GFS;

(b) the enhancements involved product design, product development, installation and necessary arrangements for compliance with the airworthiness test. For protection of the copyright in the design of aircraft and ensuring compatibility with the aircraft, the enhancements had to be arranged by the existing contractor;

(c) if the aircraft were to be modified by a new supplier, it would be difficult to hold the existing contractor accountable for future failure; and

(d) to meet the aircraft delivery schedule, it would be more effective to vary the existing contract instead of arranging another tendering exercise.

Contract variation 2

3. In June 2013, the GFS obtained the GLD Tender Board's approval to acquire a life support stretcher system for the two new aircraft at a cost of $5.5 million by way of a contract variation.

4. According to the GFS, in a visit to the contractor during the aircraft assembly stage in March 2013, it was found that the life support stretcher system could enhance the medical support capability during long distance patient transportation. The justifications for procurement by a contract variation were similar to those of Contract variation 1 (see para. 2(b) to (d)).

Acronyms and abbreviations

Audit	Audit Commission
B/Ds	Bureaux/departments
CAD	Civil Aviation Department
CDR	Commander Discretion Report
COR	Controlling Officer's Report
DoJ	Department of Justice
FC	Finance Committee
GFS	Government Flying Service
GLD	Government Logistics Department
HKPF	Hong Kong Police Force
km	Kilometres