Developing Air Force's Combat Aircrew

Department of Defence

Australian National
Audit Office

Canberra   ACT
25 May 2004

Dear Mr President
Dear Mr Speaker

The Australian National Audit Office has undertaken a performance audit in the Department of Defence in accordance with the authority contained in the *Auditor-General Act 1997*. I present the report of this audit and the accompanying brochure to the Parliament. The report is titled *Developing Air Force's Combat Aircrew.*

Following its tabling in Parliament, the report will be placed on the Australian National Audit Office's Homepage—http://www.anao.gov.au.

Yours sincerely

P. J. Barrett
Auditor-General

The Honourable the President of the Senate
The Honourable the Speaker of the House of Representatives
Parliament House
Canberra   ACT

AUDITING FOR AUSTRALIA

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Contents

Figures and Tables

Figures

Tables

Abbreviations

2 FTS	No. 2 Flying Training School
2 OCU	No. 2 Operational Conversion Unit
ACG	Air Combat Group
ADF	Australian Defence Force
ADFA	Australian Defence Force Academy
ANAO	Australian National Audit Office
ASTOPR	Australian Theatre Operational Preparedness Requirement
AUSBAT	Australian Basic Abilities Test
BFTS	Basic Flying Training School
CAFAC	Chief of Air Force Advisory Committee
CDF	Chief of the Defence Force
CFS	Central Flying School
COMSURV	Combat Survival Course
CPD	CDF Preparedness Directive
CVS	Cargo Visibility System
DFR	Defence Force Recruiting
DMO	Defence Materiel Organisation
FCI	Fighter Combat Instructor
FEG	Force Element Group
JCPAA	Joint Committee of Public Accounts and Audit
JSCFADT	Joint Standing Committee on Foreign Affairs, Defence and Trade
LNIDS	Lotus Notes Interim Demand System
MRO	Military Response Option
OFI	Operational Flying Instructor
OPCON	Operational Conversion Course
OTS	Officer Training School
PAES	Portfolio Additional Estimates Statements

PBS	Portfolio Budget Statements
PE	Peacetime Establishment
PRTG	Psychology Research Technology Group
PSA	Pilot Selection Agency
PSM	Pilot Sustainability Model
PSS	Pilot Sustainability Study
QFI	Qualified Flying Instructor
RAAF	Royal Australian Air Force
RAN	Royal Australian Navy
RAP	Rapid Acquisition Program
RoE	Rate of Effort
SAN	School of Air Navigation
SDSS	Standard Defence Supply System
SQN	Squadron
US	United States
USAF	United States Air Force

Summary and Recommendations

Summary

Background

1.   The Air Combat Group (ACG) provides Australia's air combat capability, which is based on 28 F-111 strike/reconnaissance aircraft and 71 F/A-18 (*Hornet*) multi-role fighter and strike/interdiction aircraft.

2.   Air combat aircraft are dependent on properly trained pilots to be flown safely in all operating environments, and their advanced weapon systems require highly skilled aircrew[1] to ensure effective employment to achieve military objectives. The cost of training combat pilots is estimated by Defence[2] at \$15.2 million for a *Hornet* pilot and \$10.8 million for an F-111 pilot.

3.   To acquire the skills to operate Australia's combat aircraft effectively in the full range of military roles expected, aircrew require more than three years[3] flying training in the Air Force before they are operationally deployable. For the full range of skills, experience and leadership abilities required for a squadron[4] to operate safely and effectively as a combat unit, in a credible combat situation, aircrew need to include some very experienced personnel.

4.   Air Force is looking to introduce a new aircraft, the F-35 *Joint Strike Fighter*, to replace the F-111s and *Hornets* from 2012 onwards.[5] The F-111 fleet is to be withdrawn from service by 2010 and the *Hornet* fleet is expected to reach the end of its operational life by 2015. Defence has undertaken to provide advice to Government in 2005 on the best way to transition to a new air combat platform to meet Australia's air combat capability requirements in the future.[6]

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[1]   Aircrew includes ADF pilots, navigators in Air Force and observers in Navy.

[2]   'Defence' comprises the Department of Defence and the Australian Defence Force (ADF, consisting of the three Armed Services, the Royal Australian Navy (Navy), the Australian Army (Army) and the Royal Australian Air Force (referred to in this report as Air Force and, alternatively, RAAF).

[3]   The time period varies from a minimum of three years and two months (plus travel and leave periods between courses) to a maximum of four years (plus travel and leave periods).

[4]   The smallest element of an air force is a flight, comprising two or more aircraft with a common mission under the command of a flight lead. A squadron is the key flying and administrative unit in Air Force. It is the key aerospace combat unit and usually consists of two or more flights under the command of an officer of Wing Commander rank. A Wing in today's Air Force, coordinates current operations, training, exercises and engineering. Force Element Groups (FEGs) provide the tactical combat power of the Air Force. See *Fundamentals of Australian Aerospace Power*, Royal Australian Air Force, fourth edition, August 2002, pp. 236–238.

[5]   Defence evidence to the Joint Standing Committee on Foreign Affairs, Defence and Trade (JSCFADT), Defence Subcommittee, *Hansard*, 15 December 2003, p. 49.

[6]   JSCFADT, *Report No. 111, Review of the Defence Annual Report 2001–02*, October 2003, para. 5.34.

Audit approach

5.　　Air Force has experienced shortages in the number of fast-jet pilots and navigators for a number of years. A 1999–2000 ANAO audit of *Tactical Fighter Operations*[7] included an examination of Defence's management of the *Hornet* pilot workforce. The Joint Committee of Public Accounts and Audit (JCPAA) reviewed the ANAO report and recommended that the ANAO conduct a follow-up audit focusing on Air Force's management of the air combat pilot workforce.

6.　　Of the six relevant recommendations contained in the 1999–2000 audit, Defence has implemented five. On the sixth recommendation, concerning the formulation and implementation of a tactical fighter pilot workforce plan, substantial progress has been made as part of work undertaken in the wake of an Air Force pilot sustainability study, and combat aircrew workforce management initiatives in ACG.

7.　　In the current audit, the objectives were to provide assurance to the Parliament on the adequacy of the measures and plans instituted by Defence to ensure that the combat aircrew workforce meets military preparedness requirements[8] in the future, and to identify possible areas for improvement.

Key audit findings

Recruiting and Training Practices (Chapter 2)

8.　　Until 2002, Air Force had a target of graduating 57 pilots a year. The target was based on a workforce planning approach in which the junior Air Force pilots were the feeder stream for a set number of senior rank positions. Their number was to be sufficient to support a pyramidal structure encompassing the Air Force officer ranks up to its Chief.

9.　　In the 10 years to 2002, the average number of Air Force pilot graduates was around 42 per year. Attempts to raise the number of graduating pilots were made repeatedly. However, constraints, such as limits on the number of flying hours that could be flown by training aircraft, prevented Air Force from achieving substantial long term increases in the number of pilots being trained.

10.　　Increases in pilot trainee intakes did occur in some years, but indications in the audit were that flying training courses in which the intakes were raised substantially from long term averages tended to have higher

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[7]　ANAO Audit Report No.40 1999–2000, *Tactical Fighter Operations*. Recommendations in that report relating to combat aircrew are listed in Appendix 1.

[8]　Military preparedness requirements are derived from the Chief of the Defence Force (CDF) Preparedness Directive (CPD). See Chapter 3.

failures rates. This significantly reduced, if not annulled, the effect of raising the intakes. Air Force's annual pilot graduation target is now 42, which accords with the long term average.

11. Air Force has acknowledged the need to replace the previous pilot workforce planning approach with a capability based model. Development work on such a model had been undertaken by Air Force and the model was still being refined in 2003–04. The ANAO considers that work on that model should be completed and incorporated in a comprehensive combat aircrew workforce strategy to be developed and implemented by Defence. This would help ensure that Defence resources are allocated cost-effectively to meet the nation's requirements for combat aircrew in the future.

12. There also is scope to enhance training outcomes by incorporating into pilot selection testing the results of many years of research and development undertaken and/or funded by Defence psychologists. Given the high training costs for pilots, an improvement in selection would be likely to provide significant resource savings.

13. Air Force has developed effective systems for training and developing aircrew skills. Air Force pilots, navigators and instructors have categorisation schemes to reflect the proficiency levels of their professional skills. The ANAO found that the categorisation schemes for F-111 and *Hornet* aircrew are methodically managed, with a view to ensuring that the allocated flying hours, the fatigue burden on aircraft and usage of munition and other expendables, are set in sufficient quantity to meet safety and military preparedness requirements. The schemes provide reasonable assurance that resources are used cost-effectively, as they seek to achieve and maintain agreed levels of military preparedness.

Combat Aircrew Preparedness (Chapter 3)

14. The extent to which the F-111 fleet was able to meet military preparedness requirements was compromised in the past by low aircraft availability. In 1995–96, the F-111 fleet experienced the first of a series of significant drops in flying hours. In 1998–99 and 1999–2000, the fleet did not meet Defence preparedness requirements in full. Following another substantial fall in flying hours in 2000–01, the fleet failed to meet both its short and longer term preparedness requirements. Remedial action by Defence, including increased logistic resources and effective fault rectification, had improved aircraft availability by late 2003. For 2002–03, the F-111 capability was able to meet short term preparedness requirements and substantially met the longer term preparedness requirements related to combat aircrew.[9]

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[9]   See Defence Annual Reports 1995–96 to 2002–03.

15. The ANAO found that the *Hornet* fleet has met the short term military preparedness requirements since 2001–02. In that year, longer term preparedness requirements were only partially achieved because *Hornet* pilot training throughput was affected by problems related to the introduction of the *Hawk* training aircraft. In 2002–03, the situation improved and the *Hornet* capability substantially met its longer term preparedness requirements.

Case Study: Hornets' Middle East Deployment (Chapter 4)

16. In January 2003, No. 75 Squadron, which was chosen to fly and support Australia's detachment to the Middle East of 14 *Hornet* aircraft, was augmented by aircraft, aircrew and ground personnel from other Air Force units to meet the expected requirements of the deployment. The Squadron undertook four weeks of general force preparation training for an overseas deployment and intensive flying training in Australia. This was followed by four weeks training in the Middle East, to prepare the Squadron for its assigned role in the Coalition's air combat force. The Squadron was assessed as combat ready at the commencement of military operations against Iraq.

17. The Squadron carried out its military tasks from March to early May 2003. The Defence documentation examined by the ANAO indicates that, with few exceptions, the *Hornets* carried out the required flying missions. Mission cancellations were generally not due to factors under the control of the Squadron or Australian Defence elements supporting it. In the employment of its weaponry, the results achieved by the Australian *Hornets* were, at the least, matching those of Coalition partners employing similar technology.

18. Post operational reporting by the Squadron and Defence's September 2003 Report on the 2003 military deployments to the Middle East indicate that, although ADF operations were successfully conducted, problems encountered in previous ADF operations have persisted. These problems relate to a lack of responsiveness to end users in theatre joint logistics; lack of coordination in logistic information management; inadequate logistic and administrative training and experience of Defence personnel; and the lack of an accurate and efficient personnel tracking system.

19. The ANAO found that the persistence of these problems over a number of years points to the need for Defence to more closely monitor action to remedy them.

Future Aircrew Requirements (Chapter 5)

20. Air Force's recent involvement in a number of overseas operations has emphasised the importance of available operational capabilities. By the end of 2003, falling Air Force pilot separation rates, lateral recruitment and posting priority for operational squadrons have enabled Air Force to be close to full

staffing of its operational fast-jet positions. The shortage of navigators persisted. Air Force is seeking to raise navigator numbers through increased recruitment and training.

21.   Training the right number of pilots is important because of the distortions that occur if the numbers are wrong. Training too many pilots results in resources (both pilots and their training and support) not being used effectively. In the last two years, Air Force has been reviewing the target number of pilot graduates required and has reduced numbers. Recent reviews by ACG of the number of trainees required in the fast-jet training pipeline indicated that trainees numbers could be reduced by at least 15 per cent without reducing military capability. ACG has reduced their training targets by that order. The ANAO considers that Air Force should examine the implications of that reduction on the overall number of Air Force pilot trainees.

Overall audit conclusion

22.   The ANAO found that a combination of factors, including a significant reduction in pilot separations; recruitment of foreign pilots; re-engagements of ex-Air Force personnel; and posting priority to operational units, has allowed Air Force to substantially meet the operational requirements for air combat pilots by late 2003. However, at that time, shortages still existed in the F-111 navigator workforce. Air Force has taken remedial action to overcome those shortages by increasing the intake of trainee navigators and training personnel in Canada.[10]

23.   Processes to recruit, select and train combat aircrew are generally effective. A recent reduction in ACG's fast-jet trainee pilot intake targets, and a number of Air Force combat aircrew management initiatives, are assisting in remedying structural distortions in that workforce. The measures taken by ACG should enhance its ability to maintain the required number of instructors and grow the number and the experience base of operational combat pilots.

24.   The ability of the F-111 and the *Hornet* aircrews to meet military preparedness levels has, in the past, been compromised by low aircraft availability. This has meant that, at various times, Defence preparedness requirements have not been met. Recent improvements to logistics and maintenance management and resourcing have increased aircraft availability, enhancing Air Force's ability to meet preparedness and training requirements.

25.   In examining the performance of combat aircrew in the 2003 deployment of *Hornet* aircraft to the Middle East, the ANAO found that the combat aircrew were able to meet the operations' military requirements and

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[10]   Delays in the introduction of a new navigator trainer aircraft have limited Air Force's ability to meet navigator training requirements.

carried out their tasks satisfactorily. In reviewing the Squadron's and other Defence post-deployment reporting, the ANAO noted some significant logistic and administrative problems which, while not the focus of the audit, have been addressed because of their importance. The ANAO considers that, to help ensure that adequate improvements are achieved, Defence, in its senior governance committees, should periodically review the progress made in overcoming logistic and administrative deficiencies identified in significant military operations.

26.   Following the terrorist attacks of 11 September 2001, a significant drop in global airline activities reduced demand for airline pilots. The current external environment, which is conducive to Air Force pilot retention and recruitment, may not persist indefinitely. Consequently, Air Force combat aircrew workforce planning has taken this into account. Since a 1999–2000 ANAO audit on *Tactical Fighter Operations*, Air Force has continued to implement various measures to improve the management of the combat pilot workforce to meet military preparedness requirements. The replacement of both the F-111 in 2010 and the *Hornets* in the period 2012-15 poses additional challenges to ensure a smooth transition for Air Force's combat aircrew. The ANAO considers that there would be merit in Defence reporting annually progress made in the development and implementation of a long term workforce strategy for combat aircrew.

Response to the report

27.   The ANAO made two recommendations aimed at Defence improving its recruiting and selection practices and processes, and putting in place a comprehensive workforce strategy to help meet the air combat preparedness requirements of the future. A third recommendation was directed at Defence resolving some significant logistic and administrative problems which came to the ANAO's attention in the course of reviewing the 2003 military deployment to the Middle East. Defence agreed to all three recommendations.

28.   Defence provided the following response:

> Defence agrees with the three proposed recommendations. In respect of Recommendation 2, the Hingston Report, an evaluation of ADF logistics support to operations in the Middle East, shows that Defence is already addressing the issue of improved rapid acquisition and other deficiencies in deployments. The Report identified 81 key issues, proposed 43 lessons learned and offered 90 recommendations. These recommendations are currently being implemented.

Recommendations

Set out below are the ANAO's recommendations, with report paragraph references and an indication of the Defence response.

Recommendation No.1 Para 2.8

The ANAO recommends that, in order to obtain a practical benefit from many years of research and development, Defence's evaluation of the Australian Basic Aptitude Test be finalised and appropriate enhancements be incorporated into Defence recruiting and selection practices and processes.

Defence response: Agreed.

Recommendation No.2 Para 4.37

The ANAO recommends that Defence:

(a) review the effectiveness of the Rapid Acquisition Program to ensure that it operates within an appropriate framework; and

(b) monitor, through periodic reviews in its senior governance committees, that adequate progress is made in overcoming logistic and administrative deficiencies identified in significant military operations.

Defence response: Agreed.

Recommendation No.3 Para 5.36

The ANAO recommends that, to help meet the military preparedness requirements for air combat in the future, Defence prepare a comprehensive workforce strategy for combat aircrew and report progress on its development and implementation as part of the Annual Report.

Defence response: Agreed.

Audit Findings
and Conclusions

1. Introduction

This chapter outlines the background to the audit, the recruitment and training system for combat aircrew, the audit approach and the report structure.

Background

1.1   In the Government's strategic guidance to Defence, air combat is the most important single military capability for the defence of Australia. Air combat contains two aspects, control of the air and air strike. Control of the air over Australia's territory and maritime approaches is critical to all other types of operations in the defence of Australia. Air strike is important because it provides the flexibility to pursue a proactive military strategy, including scope to determine the pace and location of hostilities and the destruction of hostile forces, before they are launched towards Australia and when they may be most vulnerable. Air combat forces also can provide support to ground and maritime forces and offer options to Government for international military deployments.[11]

1.2   The Air Force's fleet of F/A-18 *Hornet* aircraft have the primary responsibility for control of the air. Australia's military strike capability consists primarily of Air Force's fleet of F-111 aircraft.[12] ACG provides both capabilities.

1.3   To provide the strike and reconnaissance capability, ACG operates 17 F-111C strategic strike aircraft, four RF-111 reconnaissance aircraft and seven F-111G training aircraft. Air Force holds an additional seven F-111G airframes, of which two have been used to provide spares parts and five are held in long term storage (likely to be used for spares in the future). Australia made an initial purchase of 24 F-111C aircraft, which were delivered in 1973. Four of these aircraft were modified in the late 1970s for the reconnaissance role. Four additional aircraft were bought in the 1980s, and 15 surplus US F-111Gs in 1993. Eight aircraft have been lost in accidents.

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[11]   *Defence 2000—Our Future Defence Force*, Defence Publishing Service, December 2000, pp. 84–85 and 92. Referred to as *Defence 2000*.

[12]   ibid., p. 92. At the time of audit fieldwork, the combat roles of the *Hornet* and F-111 aircraft were specified in the *Chief of Air Force Capability Directive Financial Year 2002–03*. The operational outcomes to be achieved by both aircraft were specified in the Australian Theatre Operational Preparedness Requirement (ASTOPR) 2002. The details of the combat roles and the operational outcomes for the two aircraft types are security classified. Chapter 1 of ANAO Audit Report No.39 2002-03, *Navy Operational Readiness,* outlines the Defence-wide framework for preparedness planning and management.

1.4 ACG's capability for control of the air is provided by 71 *Hornet* aircraft. 75 *Hornets* were acquired between 1985 and 1990. Four have been lost in accidents.

1.5 In support of the *Hornets*, ACG operates four P-C9/A(F) forward air control aircraft. ACG also has 33 *Hawk* 127 lead-in fighter aircraft.[13]

1.6 To achieve Air Force's military objectives, combat aircrew must:

- fly the aircraft safely in all operating environments;

- operate the aircrafts' weapon systems effectively;

- exercise professional judgements in carrying out their tasks;

- update air combat tactics to make optimal use of the capabilities of the aircraft and their weaponry; and

- provide a human edge towards the achievement of success in air combat.[14]

Recruitment and training system

1.7 To be eligible for aircrew training, applicants undergo testing at Defence Force Recruiting (DFR) centres.[15] If they pass this preliminary testing, pilot applicants are considered for more comprehensive testing in the Flight Screening Program. Pilot and navigator applicants must also meet officer entry requirements, as these specialisations must undertake officer training. After satisfying these initial requirements, trainees undergo training for anywhere between three and seven years (if a four-year degree is studied at the Australian Defence Force Academy (ADFA))[16] before becoming a member of an operational squadron. The recruiting and selection processes for Air Force combat pilots and navigators are described in greater detail in Appendix 2.

1.8 Air Force's recruitment targets for pilots and navigators are based on modelling from the Directorate of Workforce Planning and Establishments and

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[13] The *Hawk* is a fast-jet training aircraft and also provides support to other ADF training activities. It has not been assigned any preparedness requirement.

[14] *Fundamentals of Australian Aerospace Power*, op. cit., and ANAO discussions with ACG.

[15] DFR is a composite organisation consisting of personnel from Defence and Manpower Services (Australia) Pty Ltd. It is responsible for delivering ADF recruiting services.

[16] Pilot trainees going to ADFA undertake a three year degree course (with some undertaking a fourth (Honours) year) or a two year Bachelor of Technology (Aviation) degree. Bachelor of Technology (Aviation) trainees, after two years academic study, undertake an aviation-related project and have to complete No. 2 Flying Training School (2 FTS) to receive their degree.

historical data.[17] The pilot and navigator recruitment targets are set differently from other skill sets in Air Force, because of long training lead times and the desire to have a constant number of trainees commencing training each year to reduce fluctuations in training numbers and number of graduates entering the FEGs.[18]

1.9   Due to the nature of its business, Air Force has the highest recruiting target of the three Services for pilots. In 2003–04, the targets were 90 for Air Force, 30 for Army and six for Navy. The recruiting targets for navigators in 2003–04 were 20 for Air Force and 16 for Navy.[19] Air Force's aircrew operate aircraft in ACG, Surveillance and Response Group and Air Lift Group.

1.10   Following selection by a Service, pilot trainees attend either ADFA (for up to four years) or the Officer Training School (OTS) (for 15 weeks). The elements of the first phases of flying training are outlined below:

- **Basic Flying Training School (BFTS):** Following completion of study at ADFA or training at OTS, and combat survival (COMSURV)[20] training, about 150 trainees a year commence the 26 week flying training course at BFTS. About 65 per cent of those trainees graduate from BFTS and proceed to an aviation medicine course.

- **2 FTS:** After BFTS, about 70 Air Force and Navy pilot trainees[21] a year proceed to 40 weeks of training at 2 FTS, which is located on RAAF Base, Pearce (Western Australia) and operates the P-C9/A.[22] At 2 FTS, trainees are assessed for their suitability for fast-jet training.[23] Upon

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[17]   In setting targets, consideration is given to the future number of positions for an employment group, forecast separations, training lead-times, training capacity, training failure rates and promotions to the next rank. Recruiting targets in any given financial year do not directly equate to the number of trainees in that year as candidates may be recruited in one financial year (eg May) but commence pilot training in the next year.

[18]   For more details on the setting of recruitment targets of pilots refer to Chapter 5 and for navigators refer to Appendix 3.

[19]   Navy uses the term observer for this specialisation.

[20]   Defence estimates (December 2003) show a cost of $9 800 per student for COMSURV training. Training course costings in this chapter have been prepared by Defence to reflect the full cost of training for cost-recovery purposes for foreign trainees. Figures in this report are rounded down if the end digit is less than five, and rounded up if the end digit is five or more. Totals are the sums of unrounded figures.

[21]   After BFTS, about 30 Army pilot trainees proceed to the School of Army Aviation at Oakey (Queensland).

[22]   The P-C9/A is a two seat advanced training aircraft.

[23]   Navy trainees also move to aircraft specific training after completing training at 2 FTS. Air Force pilots tend to specialise as an instructor or test pilot after they have completed a four-year tenure as pilots. ACG considers as a specialist anyone with a tertiary pilot qualification such as flying instructor or test pilot. ACG notes that in the past, pilots have not achieved two full operational tours before undergoing specialist training and have not returned four years of service for their specialist training prior to resignation or promotion to Squadron Leader. ACG considers that under these circumstances, the fighter force has not been self-sustaining.

completion of training at 2 FTS, trainees are awarded their 'wings' and appointed as pilots. At this stage, the ADF recruiting contractor is paid between $8 000 and $10 000.[24] About 42 Air Force and eight Navy trainees graduate from 2 FTS a year (70 per cent of 2 FTS's intake).

- **79 SQN:** From the Air Force trainees graduating from 2 FTS, those trainees selected for fast-jet training proceed to 79 SQN, also located on RAAF Base, Pearce. At 79 SQN they undertake 12 weeks training in phases one and two of the *Hawk* operational conversion course. In those two phases, trainees acquire *Hawk* aircraft competencies and initial fast-jet flying and combat skills.[25]

- **76 SQN:** After 79 SQN, trainees undertake 22 weeks (23 weeks for courses held in the first half of the year, to compensate for the number of public holidays in that period) of training in phases three to five of the *Hawk* operational conversion course at 76 SQN, located on RAAF Base, Williamtown (New South Wales). Toward the end of the course, trainees are advised to which combat aircraft type they are streamed.

1.11   Figure 1.1 summarises the fast-jet pilot selection and initial training process, up to the point where trainees are awarded their 'wings' and appointed as pilots. The numbers in boxes are the average annual numbers of trainees at the respective selection and training phases.

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[24] $10 000 is paid when the number of enlisted candidates is less than or equal to 85 per cent of enlistment target and $8 000 is paid when the number of enlisted candidates is greater than 85 per cent of enlistment target, (ANAO Audit Report No. 10 2003–04, *Australian Defence Force Recruiting Contract*, Table 11, p. 82).

[25]   The numbers of graduates on the operational flying training courses for fast-jet pilots are security classified.

Figure 1.1

Fast-jet pilot selection and initial training

Selection Process
(ADF PSA Tamworth)

Training
(ADF BFTS Tamworth)

(2 FTS Pearce)
RAAF/RAN

Operational / FEG Conversion

Recruiting Process

~ 500
Candidates are sent to ADF PSA

Selection Process

275
Selected for flight screening

180
ADF PSA
Pool [a]

ADFA / OTS

COMSURV

152 [b]

Aviation Medicine

~ 70 [c]

~ 30 [d]

School of Army Aviation (Oakey)

42 RAAF/8 RAN for operational conversions

~ 25–30 for Army Aviation operational conversions

Notes:

(a) About 180 are recommended for pilot training from the ADF Pilot Selection Agency (ADF PSA). See Appendix 2.

(b) Four courses of 38 trainees split into two components ('A' and 'B') to produce 8 courses of 19 trainees. 'B' component normally attends COMSURV and commences the BFTS course four to six weeks after 'A' component. On completion of BFTS, 'A' component attends COMSURV. The two courses rejoin at Aviation Medicine training enroute to 2 FTS for advanced flying training.

(c) 60–80 trainees a year commence training in four courses at 2 FTS. 2 FTS currently graduates about 42 RAAF trainees for operational Air Force training and approximately eight RAN trainees each year.

(d) Army trainees go directly to Army Aviation Training Command for aircraft specific training.

Source: Prepared by Air Force Training Command.

1.12   After 76 SQN, trainees are pooled in the two *Hawk* operational flights located in 76 SQN and 79 SQN. The two flights undertake support tasks for the ADF. In these flights, pilots acquire increased proficiency on the *Hawk*, awaiting the next available vacancy on a *Hornet* or F-111 operational conversion course. However, some trainees will be selected to remain on the *Hawk* aircraft to carry out ADF support tasks.[26]

1.13   Students selected for the F-111 aircraft are posted to 6 SQN[27] at RAAF Base, Amberley (Queensland), to undertake operational conversion training on the F-111s for 26 weeks.[28] At 6 SQN they are first trained in its training flight, and then in its operational flight. After 6 SQN, F-111 pilots are transferred to the operational F-111 squadron, 1 SQN, also located at Amberley.

1.14   After flying on the *Hawk*, trainees streamed for the *Hornet* aircraft attend a 23 week Operational Conversion Course (OPCON) at No. 2 Operational Conversion Unit (2 OCU), where they are transitioned to the *Hornet*. After OPCON, trainees are transferred into an operational squadron either based at RAAF Base, Williamtown or RAAF Base, Tindal (Northern Territory). As well as running courses for *Hornet* trainees, 2 OCU conducts a two-week refresher component for pilots who have been out of a flying role for more than nine months and a biennial post-graduate Fighter Combat Instructor course. After 2 OCU, *Hornet* pilots are posted to an operational squadron.
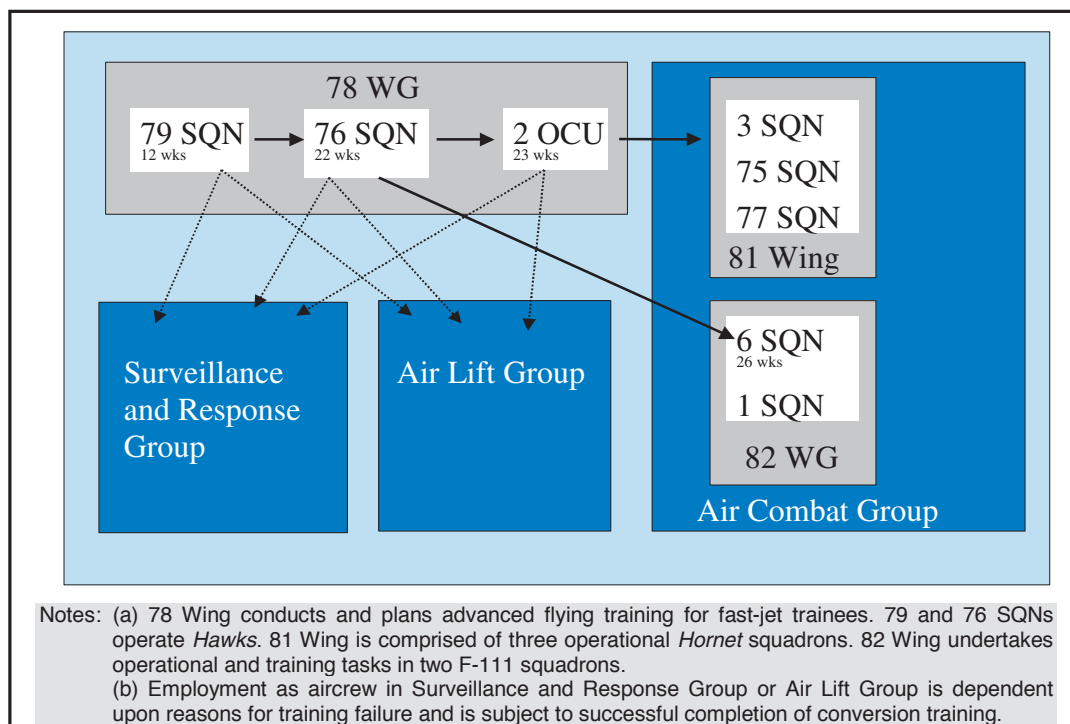
1.15   Figure 1.2 summarises the training process on fast-jets, for pilots selected for that pilot stream. Bold arrows indicate the normal training path for a fast-jet pilot, while the finer broken arrows represent possible flying duties employment in Surveillance and Response Group and Air Lift Group. Pilot selection is based on the requirements to be met by fast-jet pilots.

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[26] The number of trainees allocated to the respective units is based on liaison of 78 Wing with 81 and 82 Wings. The Officer Commanding 78 Wing has the responsibility for allocating trainees to training courses.

[27] Although 6 SQN is part of 82 Wing, on the training function it reports to 78 Wing, which holds training function responsibility for all three fast-jet aircraft types.

[28] The training curriculum for the F-111 operational conversion course was modified and re-written in 1999–2000 with the outcome being the delivery of a new course in 2000 by 6 SQN. The new course allows most of the training to occur on the F-111G. At the end of the conversion course, trainees transition to the F-111C.

Figure 1.2

Operational/FEG conversion training

Notes: (a) 78 Wing conducts and plans advanced flying training for fast-jet trainees. 79 and 76 SQNs operate *Hawks*. 81 Wing is comprised of three operational *Hornet* squadrons. 82 Wing undertakes operational and training tasks in two F-111 squadrons.
(b) Employment as aircrew in Surveillance and Response Group or Air Lift Group is dependent upon reasons for training failure and is subject to successful completion of conversion training.

Source: Compiled by the ANAO from information provided by Air Force.

Audit approach

1.16   The ANAO's audit report on *Tactical Fighter Operations*[29] included an examination of Air Force's management of the *Hornet* pilot workforce. The JCPAA reviewed the audit report and, in its Report 382 of June 2001, commented that the management of the fast-jet[30] pilot workforce was the key issue[31] and recommended that the ANAO should conduct a follow-up audit in two to three years.

1.17   In response to the JCPAA's recommendation, the ANAO began audit activity in May 2003. The audit objectives were to provide assurance to Parliament on the adequacy of the measures and plans instituted by Defence to

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[29]   ANAO Audit Report No.40 1999–2000, op. cit., pp. 42–66.

[30]   The F-111, *Hornet* and *Hawk* aircraft are fast-jets.

[31]   JCPAA, *Report 382, Tactical Fighter Operations; Magnetic Resonance Imaging Services; High Wealth Individual Taskforce. Review of the Auditor-General's Reports 1999–2000 Fourth Quarter*, June 2001.

ensure that Air Force's combat aircrew workforce meets military preparedness requirements into the future, and to identify possible areas for improvement.[32]

1.18 Audit criteria were developed, focusing on how Defence determined the required number of combat aircrew; their training and development of professional skills; and the extent to which they met operational preparedness requirements.

1.19 Field work was undertaken from June to September 2003. In November 2003, the ANAO forwarded a discussion paper to Defence for comment. Defence's comments were received in January 2004. A draft audit report was provided to Defence in March 2004.

1.20 The audit was conducted in accordance with ANAO auditing standards at a cost to the ANAO of $395 000.

Report structure

1.21 Chapter 2 reviews the Defence recruiting and training practices, the cost of training and resource issues related to combat aircrew. Chapter 3 explores to what the extent F-111 and *Hornet* aircrews have met military preparedness requirements. Chapter 4 discusses the 2003 deployment of a *Hornet* squadron to the Middle East including preparatory activities undertaken in Australia and issues related to the support of that deployment. Chapter 5 outlines the situation faced by Air Force in managing the combat aircrew workforce and reviews the measures taken or planned to help ensure that Defence's requirements for combat aircrew are met.

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[32] In considering future military requirements for pilots, the ANAO reviewed the publicly available planning guidance from today's leading-nation in military technology, the United States (US). In the timeframe to 2027, the US Department of Defense sees the role of unpiloted aircraft as taking over from piloted aircraft in three specific mission areas, categorised as the 'dull', 'dirty' and 'dangerous', that is:
- taking over human sentry tasks (the 'dull') by unpiloted aerial vehicles equipped with automatic cuing algorithms and multiple sensors;
- reconnoitring areas contaminated with radiological, chemical or biological agents (the 'dirty'); and
- high risk, suppression of enemy air-defence missions (the 'dangerous').

The US Department of Defense concluded that unpiloted vehicles are potent force multipliers, releasing piloted aircraft for other tasks than the three specific mission areas mentioned above. (see *Unmanned Aerial Vehicle Roadmap 2002-2027*, Office of the Secretary for Defense, Washington, December 2002)

On that basis, the ANAO considers that it is not unreasonable to assume that there will be a continuing need for combat aircrew in the Air Force in the foreseeable future.

Hornets commencing takeoff.

Source: Department of Defence.

2. Recruiting and Training Practices

This chapter discusses the selection, recruiting and training practices for combat aircrew and related cost and resource issues.

Australian Basic Abilities Test (AUSBAT)

2.1   Testing for the required abilities for fast-jet and other pilots involves psychology about human cognition, for example, spatial perceptual adjustments, working memory, time sharing and divided attention. In the 1980s, the US Air Force (USAF), in its testing of pilot applicants, used machines called PORTABATs. USAF loaned two PORTABAT machines to Air Force in 1985 to help develop a new testing mechanism. USAF later recalled the machines (see Figure 2.1). Air Force approached the Royal Melbourne Institute of Technology to develop a prototype aptitude test station to Air Force psychology specifications.

Figure 2.1

AUSBAT time line
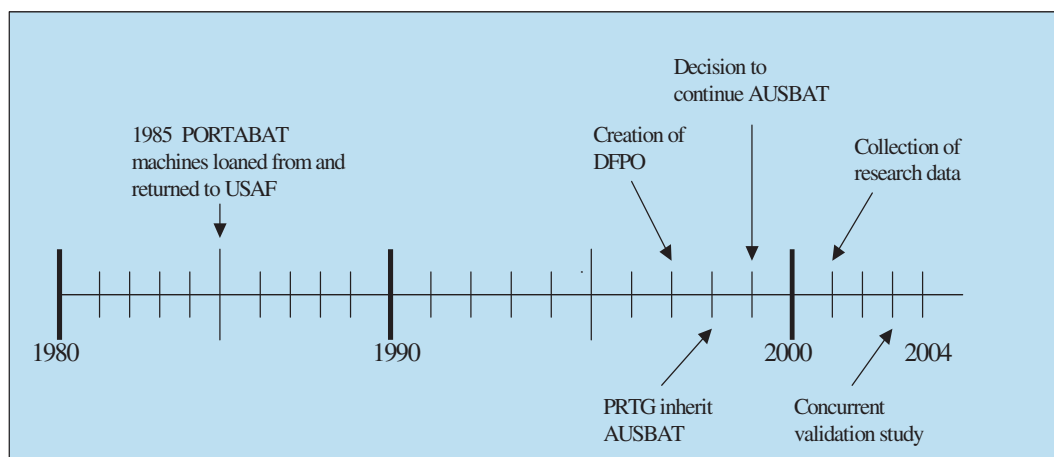
Source: Compiled by the ANAO from information provided by Defence.

2.2   Following amalgamation of the separate Service psychology organisations into the Defence Force Psychology Organisation (DFPO) in 1997 as part of the Defence Efficiency Review, Defence's Psychology Research and Technology Group (PRTG) assumed responsibility for the AUSBAT project in 1998. At the time of DFPO's formation, AUSBAT's Disk Operating System was experiencing on-going problems. In 1998, attempts failed to solve these problems and bring closure to AUSBAT developments with the Contractor. A decision was made in 1999 to continue with the project.

2.3   Defence advised the ANAO in September 2003 that the project was continued because the AUSBAT tests were (and at the time of audit were still considered to be) at the forefront of thinking in that field of psychology. The project was converted to a Windows based platform and contracted out to a new commercial developer. The contracting cost for the developmental phase of AUSBAT was $615 000 when that phase was completed in 2001.[33]

2.4   Since 2001, AUSBAT has been administered (for the purpose of collecting research data) to trainees at ADF PSA, BFTS and 2 FTS.[34] AUSBAT has also been used in other areas of the ADF, such as in a Seaman Officer and Navy aircrew study, and outside the ADF by the Australian Federal Police.[35]

2.5   Following the concurrent validation study of AUSBAT, using data from ADF flying schools, PRTG concluded that two of the AUSBAT tests could be used to significantly predict performance at BFTS.

2.6   PRTG anticipates that, on completion of further sample testing (associated with evaluation, quality control and improvement of ADF selection standards), AUSBAT will be able to predict with a greater degree of accuracy those applicants who are more likely to graduate from the training system and reduce failure rates in the training schools. PRTG advised the ANAO in August 2003 that, if the testing proved successful, AUSBAT would have the potential to 'save the Department many millions of dollars in training costs, and may have significant commercial value'. Air Force was unable to confirm what savings were achievable but considered it unlikely to be of that magnitude.

2.7   The ANAO considers that Defence should finalise the evaluation of AUSBAT. If the results of the evaluation are positive, they should be used to incorporate improvements in pilot (and other ADF) recruiting and selection processes to bring a return after some 20 years of research and development effort.

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[33]   Based on advice by Defence to the ANAO in February 2004. Defence also advised the ANAO in February 2004 that subsequent expenditure on AUSBAT for equipment and evaluation testing has been in the order of $60 000 to $65 000. As Defence cannot track the cost of Defence personnel involved in the project, the costing does not include the cost of Defence personnel involved in the project.

[34]   Defence advised that disruptions to data gathering at recruiting centres (associated with the outsourcing of recruiting) and incompatibilities between Defence's and Manpower Services (Australia) Pty Ltd's computer systems has not been beneficial to the data gathering process.

[35]   AUSBAT is currently also administered to Navy observers, Air Force navigators, air traffic controllers and air defence officers.

Recommendation No.1

2.8   The ANAO recommends that, in order to obtain a practical benefit from many years of research and development, Defence's evaluation of the Australian Basic Aptitude Test be finalised and appropriate enhancements be incorporated into Defence recruiting and selection practices and processes.

Defence response

2.9   Agreed.

Recruitment of foreign pilots

2.10   With the separation rates of the past, the levels of pilot recruitment and training, Air Force has not been able to fill all fast-jet pilot positions. Pilots from other countries have been recruited to fill shortfalls in key areas.

2.11   Under the Air Force's Labour Agreement,[36] Air Force can sponsor currently serving and ex-military foreign personnel with specific skills for employment in Air Force. Each such individual applying to join the Air Force must also apply for a permanent residency visa. Once a visa is granted and the applicant is appointed to the Air Force, the individual can apply for citizenship after three months of service.

2.12   Air Force's Labour Agreement is current for three years and requires annual negotiation of visa numbers with the Department of Immigration and Multicultural and Indigenous Affairs. This allows visa ceilings to be responsive to changes in the global aviation market and/or Air Force requirements. For example, the number of visas was increased from 35 in 2000 to 280 in 2001, when New Zealand disbanded its air combat force.

2.13   In the three years to the end of 2002–03, 21 pilots were appointed under the Agreement. Their previous country of residence is shown in Table 2.1. Seventy-five per cent of those allocated to FEGs went to pilot positions in ACG.[37]

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[36]   A Labour Agreement is a formal arrangement, negotiated between the Department of Immigration and Multicultural and Indigenous Affairs, the Department of Employment and Workplace Relations and an Australian employer or industry association, to recruit a specified number of workers from overseas in response to identified or emerging labour market shortages in the Australian labour market. Skill categories currently targeted by the Agreement include navigators and pilots.

[37]   As of October 2003, one pilot had not yet been allocated, pending operational conversion training.
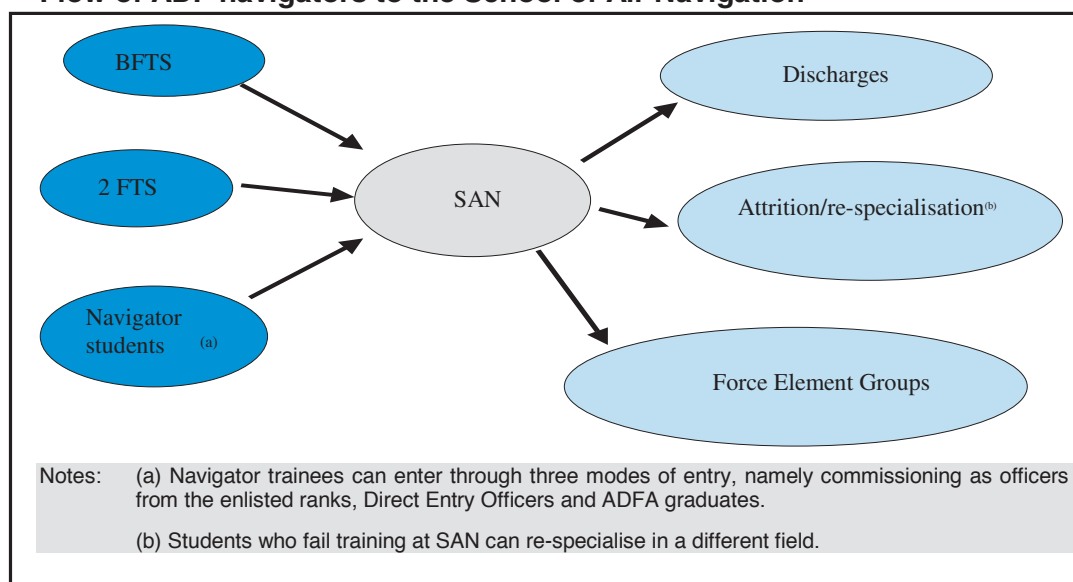
Table 2.1

Lateral Air Force pilot appointments 2000–01 to 2002–03

No. of appointments	Previous country of residence
13	New Zealand
5	Britain
2	Zimbabwe
1	South Africa

Source: Compiled by the ANAO from information provided by Defence.

Training of navigators

2.14   ADF navigators and observers are recruited and trained at the School of Air Navigation (SAN) at RAAF Base in Sale, Victoria, for F-111, Hercules and Orion aircraft. Before trainees are appointed as navigators they must pass the same OTS, COMSURV and Aviation Medicine courses as pilots. Training courses for navigators are conducted three times each year with the number of trainees varying between eight and 10. The flow of ADF navigators to and from SAN is shown at Figure 2.2.

Figure 2.2

Flow of ADF navigators to the School of Air Navigation

Notes: (a) Navigator trainees can enter through three modes of entry, namely commissioning as officers from the enlisted ranks, Direct Entry Officers and ADFA graduates.

(b) Students who fail training at SAN can re-specialise in a different field.

Source: Complied by the ANAO from information provided by Defence.

2.15 Navigators usually spend a shorter period of time waiting for initial flying training courses (four to five months) than pilots, because of the shortage of navigators. For example, in the last two years, 6 SQN has held less than half of the number of navigators required, primarily due to high failure rates. Air Force also expects that wastage rates may increase as F-111 navigators look for alternative options in the lead-up to that aircraft's withdrawal from service.

2.16 The shortage of Air Force navigators was recognised in 2001. In 2002, the Deputy Chief of Air Force approved a fixed number of 20 personnel to start navigator training, reducing to 18 personnel a year from 2004-05 onwards. This was to overcome the problems encountered in coordinating a long lead time employment category with varying forecasts of the numbers required. Delays in the introduction of a new navigator training aircraft meant that Air Force had a limited ability to meet navigator training requirements. As an interim solution, a decision was made to train navigators in Canada.

2.17 As of March 2004, 18 trainees have been sent to Canada. Defence advised the ANAO in February 2004 that this situation arose as a result of navigator resignations at short notice and unexpectedly high failure rates on F-111 conversion courses, compounded by longer completion times in some of those courses due to lower than expected aircraft availability.

2.18 Navigator trainees used to be streamed to an aircraft type eight weeks before the completion of the SAN course. In initiatives introduced in early 2002, SAN reduced the length of the navigator course from about twelve to nine months, introduced identical training for all navigators and deferred their streaming to aircraft types until the end of their course. Recommendations are then made as to the trainee's suitability for particular aircraft types.

2.19 The Directorate of Personnel Officers—Air Force advises SAN of vacancies at the FEGs. Navigators are then matched to those vacancies. Navigators selected for the F-111 undertake an Introductory Strike Navigator course (on the *Hawk*) at 79 SQN and then 76 SQN to prepare them for the high speed tactical air combat environment. On completion of that course, they undertake the F-111 conversion course in 6 SQN - the same course as pilots, but with different flying phases. Navigators typically wait two to three months before being able to undertake F-111 conversion training (that waiting period for pilots is four to six months).

2.20 In the three years to October 2003, 57 trainees had commenced the SAN course.[38] Of these, 10 were female. The overall failure rate was 26 per cent; 28 per cent for males and 20 per cent for females. Pilot trainees who fail courses

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[38]   This figure includes 12 trainees (10 male and two female) who were on course in October 2003.

at BFTS and 2 FTS can be diverted to SAN and historical data indicate that this occurs at the rate of two to three trainees a year.

Training of flying instructors

2.21   Pilot instructors are trained at the Central Flying School (CFS) located at RAAF Base, Sale. After pilots have attained a minimum number of flying hours, they can undertake training to become a Qualified Flying Instructor (QFI). In the past, when there was the requirement to make up for the high number of pilot separations, less experienced pilots from ACG were attending instructor courses. Now, course members tend to be experienced pilots. [39]

2.22   A currency check on QFIs is conducted annually by CFS. Without passing that check, instructors lose their currency.

2.23   The need to have more fast-jet pilot representation in the training units was emphasised to the ANAO during fieldwork discussions. Fast-jet pilots generally were under-represented and served a shorter instructional tour than instructors from other FEGs. For example, instructors from Surveillance and Response Group served 14–16 months at 2 FTS compared to the six to eight months served by instructors from ACG. Defence advised the ANAO in January 2004, that the current ACG commitment is four instructors for 2 FTS, two instructors for BFTS and two instructors for CFS. After September 2003, these postings are to be for two years.

Quality of aircrew

2.24   Personnel exchanges with other countries and military exercises with them, are valuable evaluation tools in assessing the performance of aircrew and instructors and permit the benchmarking of training and instructors. Air Force documentation reviewed by the ANAO consistently noted the value of international exchanges and exercises.

2.25   Participation in international air exercises, such as Exercise Red Flag,[40] often involves the deployment of over 100 personnel. The samples of post-exercise reports perused by the ANAO indicated that Air Force participation had been well planned and carried out to extract effective training value from these activities. For example, by using opportunities to

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[39] ACG also has Operational Flying Instructors (OFIs) and Fighter Combat Instructors (FCIs). OFIs are instructors with RAAF instructor training and instructional experience with an overseas air force. OFIs attend the first six weeks of the FCI course and receive flying instruction training. FCI's are given additional training (in air-to-air and air-to-surface in the last six months of the FCI course) to that given to OFIs.

[40] Red Flag is a multi-national joint air combat exercise in a hostile anti-air environment, held regularly in the US.

qualify or requalify aircrew in specific flying operations or carrying out tests which cannot be undertaken in Australia.

2.26 As well as permitting benchmarking, military exchanges and exercises develop interoperability with allied and regional forces. The performance of squadrons is evaluated whilst on exercises by unit staff, and post-exercise reports are produced for higher-level commands. A Capability Preparedness Directive value rating is given, which provides an indication of the training value against the exercise objectives and usefulness in meeting Defence preparedness guidance.

2.27 ANAO's discussions with aircrew who had experience in the skill levels and hours flown by combat aircrew in other countries indicated that, as a broad measure, Australian combat pilots had a reasonable allocation of flying hours.

2.28 The general view expressed to the ANAO during fieldwork was that Air Force produces high quality pilots on completion of their flying courses. But air combat squadrons in some countries tended to have a greater experience level as a result of longer and more numerous operational postings.

2.29 Post-exercise reporting on both *Hornet* and F-111 aircrew performance examined in the audit indicated that Australian combat aircrew achieved satisfactory results on measures such as successful completion of military missions, including targeting and self-protection measures. They were at least matching the performance of other nations' aircrew (see Chapter 4).

Categorisation scheme

2.30 Air Force pilots, navigators and instructors have categorisation schemes that reflect the proficiency levels of their professional skills. All are required to requalify their category rating annually, involving assessments and flying requirements. Without a pass in these currency checks, the ratings will be reverted.

2.31 Air Force advised the ANAO in January 2004, that the categorisation schemes were reinvigorated after a safety incident involving the loss of an aircraft and crew in 1993. More recently, Headquarters Air Command had introduced a Categorisation and Proficiency Management Scheme to improve the accuracy and effectiveness of the unit categorisation schemes. A standardisation officer (located in each of the operational squadrons) regularly reviews the categorisations scheme and aircrew logbooks.

2.32 Categorisation testing is conducted by a QFI, Fighter Combat Instructor or squadron executive before a pilot is allowed to progress from one category to the next. In the (infrequent) event that the pilot is not able to reach the standard within the expected timeframe, the pilot may be removed from the

squadron. The categorisation schemes of the F-111 and *Hornet* streams differ in the number of flying hours required to remain competent and number of hours necessary to move between the categories.[41]

2.33 F-111 pilots are trained to D and then C category, respectively, in 6 SQN's training and then its operational flights, before transitioning to 1 SQN. In 1 SQN, they are expected to reach C+ category in six months, and B category in another one to two years.

2.34 *Hornet* pilots are trained to D category at 2 OCU (which has no operational flights), and then posted to one of the three operational *Hornet* squadrons. *Hornet* pilots should attain the level of B category at the completion of about two and a half years of flying.[42]

2.35 There is a process of continuous evaluation in the squadrons with aircrews receiving daily feedback, and formal feedback at six-monthly and yearly intervals.[43] Meetings cover pilot progress and allow for remedial action to be taken in the event of a pilot not progressing as expected.

2.36 The categorisation schemes determine the number of flying hours and the range of flying required for individual aircrew to progress their skills and proficiencies in accordance with military capability requirements. Flying hours are allocated to ACG aircrew, depending on their levels in the categorisation schemes. They were allocated with a view to ensuring that the total flying hours, the type of flying and usage of munition and other expendables were set in sufficient quantity to meet safety and military preparedness requirements, but that they did not exceed those requirements. This is not infrequently a source of frustration for operational aircrew and their supervisors who would prefer to fly more and more intensively.

2.37 The systems put in place by Air Force to allocate flying hours (and, in the case of the *Hornets*, manage airframe stress) seek to achieve agreed levels of

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[41] The categorisation scheme for a *Hornet* pilot to remain competent is as follows. 'A' category (combat ready, multi-formation lead) less than 180 hours of flying per annum to remain competent; 'B' category (combat ready, aircraft lead) less than 180 hours per annum; 'C' category (combat ready) 180–200 hours per annum. 'D' category (non-combat ready) requires more than 200 hours per annum to gain sufficient experience.

In the F-111 categorisation scheme, a minimum number of total flying hours are required before the pilot is considered to be eligible for testing to move to the next category. 'D' is equivalent to non-combat ready; 'C' is 'proficient'; 'C+' category is 'tactically proficient' with a minimum of 200 hours total flying time on aircraft type; 'B' category is 'highly proficient' with a minimum of 450 hours; and 'A' category is 'select' with a minimum of 850 hours.

[42] A new categorisation scheme has been developed by 81 Wing that will have two subsets to the existing categories that define proficiency as determined by the testing officer. For example, C1 category is combat ready and capable of conducting a section lead, and C2 category is combat ready as a wingman.

[43] Formal feedback at the six-monthly interval is in the form of an interview, and an interview and report annually.

military preparedness. The aim is to reduce resource costs to the minimum amount required to achieve those levels and to ensure that aircraft reach planned withdrawal from service dates.

Training resourcing

2.38 In recent times, a decrease in the availability of aircraft flying hours available has impacted on training. For example, only three instead of the then planned four OPCON courses were run in the last two years at 2 OCU.[44] As more capabilities are added to the *Hornet* aircraft, the training load increases, both in the training and operational squadrons.[45] More capabilities add to the number of requirements to be competent in the categorisation schemes, and in turn may impact on the Combat Readiness Percentage[46] of the squadron and the frequency that some training is conducted.

2.39 Aircraft serviceability has impacted on the ability of aircrew to prepare for and participate in military exercises. Exercises that experienced low aircraft availability received a low preparedness value rating. In other instances, aircrew participation was cancelled due to a lack of serviceable aircraft. Lack of fuel led to the cancellation of an air defence exercise planned for October 2003.

2.40 Recent improvements in aircraft availability of the F-111, and increased logistic resources for both the *Hornet* and the F-111 fleets, should assist in the aircraft being able to meet Air Force's requirement for training flying hours, including the need to develop and test skills in exercises. Defence advised the ANAO in January 2004 that F-111 aircraft availability had improved to the desired levels.

Training costs

2.41 Defence estimates that it costs $15.2 million to train a *Hornet* pilot (up to and including operational conversion training at 2 OCU) and $10.8 million (up to and including operational conversion training at 6 SQN) to train an F-111

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[44] 2 OCU now plans to run three OPCON courses every two years, and an FCI course every two years as the fourth course. Chapter 5 discusses Air Force initiatives to reduce the number of pilots needing to be trained, thereby reducing the training burden.

[45] For example, there has been a 10 per cent increase in the number of training events in courses.

[46] This reflects an ACG squadron's ability to meet the requirements in air-to-air and air-to-surface combat. At the 100 per cent level, a squadron can do everything that is required.

pilot.[47] By far the largest portion of training cost is incurred in operational conversion training on the *Hornet* and the F-111, respectively ($11.2 million per trainee on *Hornets* – 74 per cent of overall flying training costs of *Hornet* pilots and $6.8 million per trainee on F-111s – 63 per cent of overall flying training costs of F-111 pilots).

2.42   Hourly cost recovery rates (indicating the cost of operating aircraft per hour of flying) for aircraft operated by ACG are provided in Table 2.2.

Table 2.2

Hourly cost recovery rates: September 2002

Aircraft type	Cost per flying hour[a] ($)
F-111	123 200
Hornet	72 833
Hawk [b]	20 564
P-C9/A	6 082

Notes: (a) Figures taken from the current release of Defence document 'Cost Recovery Rates for RAAF Aircraft', September 2002. They are based on flying hour rates issued in September 2002. The figures include personnel (ground and aircrew) costs, aircraft support, fuel and maintenance. Overheads such as training and explosive ordnance are not included, nor are infrastructure costs.

(b) The *Hawk* figure at this stage remains as an estimate as it is a new capability and Defence advised that it will not have sufficient detail of the true cost until the *Hawk* has been in service for sufficient time to allow Defence to use historical information. Defence expected this to be complete around 2006.

Source: Directorate of Resources Planning - Air Force.

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[47]   The costing was undertaken by Defence in response to a request from the ANAO. Defence advised the ANAO in January 2004, that the costing was intended to provide a 'big picture' answer to the question 'How much does it cost to train a fast-jet pilot' but does not attempt to answer the question of how much the fast-jet pilot training system costs. The costing was done on the basis of published data and standard full cost rates for personnel and aircraft hours. It excludes non-flying training (except for the COMSURV and Aviation Medicine courses) and the cost of failed trainees. Simulator costs (except for the *Hawk* training, where hourly flying costs include the cost of simulator usage) are also excluded as Defence considered them to be immaterial to the overall costs of pilot training.

2.43 The magnitude of the costs and the cost difference between aircraft types emphasise the importance of rationalising the training schedules, and of endeavours to shift training from higher to lower cost aircraft where possible and appropriate. Training syllabus rationalisation was achieved by Air Force in *Hawk* conversion training. Changes in that syllabus have reduced the training burden on the *Hornet*s, yielding overall cost benefits to Defence (by transferring training to an aircraft with significantly lower operating costs) as well as lessening the load on the limited airframe fatigue life of the *Hornet* fleet.

2.44 Plans by 78 Wing to initiate a similar program of syllabus review for the F-111 aircraft need to be progressed. The ANAO considers that, in order to ensure maximum benefit to Defence before the aircraft's withdrawal from service, such a review, including transitional arrangements for the phase-out of the F-111 aircraft, should be conducted and could be an element in an overall workforce strategy for Air Force's combat aircrew.

2.45 The ANAO notes that there was merit in Air Force's priority to first focus on training rationalisation in *Hornet* training, given:

- the potential for greater savings offered by the closer similarity (including cockpit layout) between Air Force's *Hornet* and *Hawk* aircraft (rather than the F-111);

- significantly higher costs of training of each *Hornet* pilot;

- the larger number of pilot trainees; and

- the limitations on the *Hornet* fleet's airframe life.

2.46 Simulators are used by Air Force as part of the continuous training of all pilots. The ANAO found that the extent that simulators were used in the Wings tended to vary, depending on the ability of simulators to replicate flying emergencies and resemblance to the aircraft type operated. (Simulators in many instances have not received the same upgrades as the aircraft, causing variations in the way that simulators and aircraft operate.)[48] Given the present capacities and capabilities of the simulators, Air Force pilot trainees made effective use of them, particularly for procedural training.[49]

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[48] For example, the equipment for F-111 navigators in the simulator differs from the navigator's equipment in the aircraft.

[49] When the F-111s experienced severe availability problems, 82 Wing sought to minimise the impact on training, and the daily usage rates of simulators increased from eight to 12 hours.

3. Combat Aircrew Preparedness

This chapter reviews the extent to which F-111 and Hornet aircrew have met military preparedness requirements.

Background

3.1   In 2003–04, Defence was appropriated funds for seven Outcomes. Air Force Capability, Defence Outcome 4, had a projected net cost in 2003–04 of $4.2 billion.[50] The Capability for Air Combat is Output 4.1 and is provided by ACG, headquartered at RAAF Base, Williamtown. Based on its cost attribution systems, Defence calculated that the net cost of Output 4.1 in 2002–03 was $1.8 billion.[51] The projected net cost of Output 4.1 in 2003–04 is $1.9 billion.[52]

3.2   Combat aircrew are the means by which Defence utilises the military capability inherent in ACG. To exercise that capability, they are dependent on the infrastructure, aircraft and support provided by ACG, the Defence Materiel Organisation (DMO) and other support agencies. The costs of the air combat capability, to the extent that they are captured in Defence's cost attribution systems, include the cost of training and maintaining aircrew; the support necessary to provide them with serviceable aircraft; and providing the logistic and infrastructural wherewithal to enable their successful employment.

3.3   The Defence Portfolio Budget Statements (PBS) performance targets for combat aircrew in 2003–04 are to:

- achieve levels of preparedness directed by the CDF for MROs with a warning time of less than 12 months; and

- achieve levels of training that maintain core skills and professional standards across all assigned warfare areas.[53]

3.4   Defence has been developing and refining the principles and methodologies to manage ADF preparedness. At the core of the ADF preparedness framework are MROs, which flow from the Australian Military Strategy, which is in turn derived from Government-endorsed policy guidance.

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[50] *Portfolio Additional Estimates Statements (PAES) 2003–04, Defence Portfolio*, Department of Defence, February 2004, p. 43.

[51] Advice to the ANAO by Resources Planning-Air Force, October 2003.

[52] PAES 2003–04, op. cit., p. 43

[53] PBS 2003–04, Defence Portfolio, Budget Related Papers Nos. 1.4 A and 1.4 C, May 2003, p. 95. The Defence Annual Reports since 1994-95 have incorporated requirements for air combat forces to meet the CPD.

3.5   The CPD codifies the requirements of that policy guidance, in the major initial military planning step in the preparedness management framework. The CPD is issued to the Commander Australian Theatre and the Chiefs of Navy, Army and Air Force (who are Outcome Managers). On the basis of the CPD, the Commander Australian Theatre develops ASTOPR. ASTOPR details the required preparedness levels and capabilities of ADF combat and support forces to meet the MROs.

3.6   The CPD and the ASTOPR focus their specific readiness requirements on short term credible military contingencies, that is, military operations of a kind and intensity where it would be reasonable to assume that the ADF may face with a warning time of less than a year.[54] ASTOPR includes ADF Readiness Tables.[55] For ACG, the Readiness Tables in the ASTOPR current at the time of audit fieldwork specified the number of aircraft platforms to be available for specific military roles within specified time periods.

3.7   The CPD also provides general guidance for forces required for MROs' with warning times greater than 12 months. It includes an on-going requirement to maintain core skills and competencies as 'the underpinning pillar for successful operations'.[56]

3.8   Defence's Outcome Managers sign Organisational Performance Agreements (OPAs) with the Secretary of the Defence Department and CDF. OPAs define the deliverables each capability manager is to provide in a financial year. The link of OPAs with military preparedness is through agreements, made annually, on Directed Levels of Capability, which specify readiness levels to be achieved by FEGs for a given level of resources. In Air Force, the military preparedness targets for the FEGs are contained in the Chief of Air Force Capability Directive.

Rate of Effort (RoE)

3.9   As part of its annual planning, Air Force develops a flying hours program for each financial year. The program states the planned number of flying hours for each aircraft type, funded within the annual budget.

3.10   The ability of military aircraft fleets to achieve their planned RoE and carry out the military roles assigned to them depends on three main factors:

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[54] Detailed military planning is directed towards MROs with warning times of less than 12 months, which prescribe the more immediate preparedness posture of the ADF (CPD 2002, para. 1).

[55] Readiness is the ability to prepare a capability for operations within a designated time (ANAO Audit Report No.39 2002–03, op. cit., p. 23).

[56] CPD 2002, December 2001, para. 12.

- the availability of the requisite number of aircraft, with a level of functionality to meet the requirements of their military roles;

- the availability of aircrew to operate those aircraft, with the requisite number and experience levels of aircrew to fulfil their assigned military roles (internationally, aircrew to aircraft ratios of about 2:1 are not uncommon in air operations); and

- adequate logistic support and munition to sustain the military effort for the requisite time period.

3.11   RoE has been regarded by Defence as a measure of performance on two levels; namely:

- the ability to generate a certain number of flying hours for a fleet of aircraft compared to the resources used was to be a measure for the effective management of those resources; a flying hour achievement at or near planned levels was seen as demonstrating competent management of assigned resources (output); and

- the contribution to Defence operational capability and levels of military preparedness created by the hours flown.[57]

3.12   The ANAO found a number of examples of aircraft maintenance and repair problems, such as faulty fuel tank cabling and hydraulic swivels, arising unexpectedly and requiring immediate action in terms of inspection of all aircraft in the fleet and grounding of any affected aircraft pending repair. Such occurrences have a significant impact on the ability to achieve RoE. Furthermore, planned RoE numbers were amended during the year.[58]

F-111 aircrew preparedness

3.13   The F-111 had its 30th anniversary of service in the RAAF in 2003. The hours planned to be flown by the F-111 fleet (termed planned RoE) and the hours actually flown since 1990–91 are shown at Table 3.1.

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[57] *Defence Annual Report 1995-96*, p. 103.

[58] The *Defence Annual Report 1996–97* stated that the flying hours program 'is regularly updated to take account of changed circumstances, such as revised tasking and aircraft and aircrew availability' (p. 127).

Table 3.1

F-111 fleet: Planned and actual RoE, 1990–91 to 2002–03

Year	Planned hours	Actual hours	Variance
1990–91	4 520	4 659	+139
1991–92	4 500	4 500	0
1992–93	4 400	4 397	(3)
1993–94	4 400	4 406	+6
1994–95	4 400	4 318	(82)
1995–96	4 400[a]	3 673	(727)
1996–97	4 400[a]	4 034	(366)
1997–98	4 400	4 395	(5)
1998–99	4 400	4 170	(230)
1999–2000	4 400	3 527	(873)
2000–01	4 000[b]	2 758	(1 242)
2001–02	3 600[c]	2 559	(1 041)
2002–03	2 600	2 779	+179

Notes: (a) Revised during the year to 4 000 hours.

(b) Revised to 3 600 hours by November 2000 as shown in the Defence Annual Report 2000–01, and further reduced to 3 150, as stated in the Defence response[59] in May 2003 to Question No.1444 in the House of Representatives.

(c) As shown in the *Defence Annual Report 2001–02.* The Defence response to Question No.1444 indicates that the figure was revised to 2 500 hours.

Sources: Compiled by the ANAO from information in Defence Annual Reports, Portfolio Budget Statements, Portfolio Additional Estimates Papers and Hansard.

3.14   The first material[60] drop in the RoE of the F-111 fleet occurred in 1995–96.[61] Although the F-111 fleet did not meet planned RoE that year, it met

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[59]   *Hansard*, House of Representatives, 13 May 2003, pp. 14262-3.

[60]   Material change is one that generates a variation greater than 10 per cent.

[61]   The *Defence Annual Report 1995–96*, noted that:

- The delays in the Avionics Update Program resulted in reduced availability of aircraft. Major servicings of F-111G aircraft (not forecast) contributed to the revision of annual RoE; and

- Flying hours not fully expended were due to an underfly of the aircraft involved in the avionics upgrade program, and aircraft and crew unavailability. (p. 107).

Defence's military preparedness requirements.[62] In 1998–99, the F-111 fleet achieved a RoE of over 4 000 hours. However, the Defence Annual Report for that year is the first annual report in the period since 1990–91 to state that the F-111 fleet did not meet Defence preparedness requirements in full. The report stated:

> The Strike Reconnaissance Group met all individual military strategic option requirements of the CPD for the provision of capability. However, for short periods, insufficient reconnaissance (RF-111 C) airframes were available to meet the concurrent requirements[63] of the Preparedness Directive. This was due to scheduled maintenance and modification actions to improve capability.[64]

3.15   In 1999–2000, the F-111 fleet's achieved RoE fell by 15 per cent compared to the previous year. Defence, in its Annual Report for 1999–2000, stated:

> The ageing air strike/reconnaissance fleet, coupled with the need to release aircraft for modification and 501 Wing[65] market testing, impacted on aircraft availability and resulted in a reduction in the RoE.[66]

3.16   Once again, the F-111 fleet met all the individual military strategic capability option requirements of the CPD, but insufficient assets were available to meet some concurrency requirements. In addition to the factors mentioned above, key shortfalls concerning the F-111 fleet, and issues identified by Air Force for remedial action in the 1999–2000 Defence Annual Report, included shortages in fast-jet aircrew and in engineering and technical personnel.[67]

3.17   The F-111s' achieved RoE fell another 22 per cent in 2000–01. Reduced RoE and aircraft availability resulted in the fleet being unable to meet the more demanding shorter term and longer term preparedness requirements, including the ability to maintain core skills across all operational roles.[68]

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[62]   The *Defence Annual Report 1995–96* (p. 103) stated that 'all components of (Air Force's) Combat Force are currently maintaining preparedness at specified levels of capability. For Air Force, the minimum level of capability includes as peacetime activities, conversion, categorisation and continuation training as well as tasking for operations and exercises required to maintain the capability to fulfil 'Defence of Australia' tasks'.

[63]   This refers to requirements in the CPD to meet the preparedness requirements of more than one military contingency at the same time.

[64]   *Defence Annual Report 1998–99*, p. 213.

[65]   501 Wing provided logistic support to the F-111 fleet.

[66]   *Defence Annual Report 1999–2000*, p. 226.

[67]   ibid.

[68]   *Defence Annual Report 2000–01*, p. 118.

3.18 In 2000–01, the strike/reconnaissance capability embodied in the F-111 fleet did not meet Defence's longer term preparedness requirements. The ANAO is not aware of any specific analysis by Defence on whether shortcomings in the F-111 fleet's preparedness affected its ability to meet the Government's *Defence 2000* military strategies.

3.19 In 2001–02, the F-111s' RoE fell another seven per cent. Reduced aircraft availability, caused by transitional problems in the transfer of logistic support from in-house to commercial providers, technical and occupational health and safety issues (related to the desealing and resealing of the aircraft's fuel tanks), was exacerbated by two separate major incidents involving aircraft wing cracking and fuel tank over-pressurisation. Safety and remedial measures adopted by Air Force resulted in considerable aircraft availability restrictions for significant portions of 2001–02.

3.20 With the low RoE hours achieved that year, mainly because of the low aircraft availability, the F-111 fleet did not meet short term CPD requirements, nor were the squadrons able to meet the longer term CPD requirement to maintain core skills and professional standards across all operational roles.[69] Furthermore, reduced aircraft availability affected the number of trainees that could undertake initial F-111 aircrew training, thereby reducing the number of potential operational aircrew available in the future. Thus, both short and longer term CPD requirements were not met by the F-111 fleet.

3.21 Since 1997–98, Air Force has been the only remaining operator of F-111 aircraft in the world. Defence undertook a 'life of type' buy of parts, and established contractor engineering support for the aircraft to assist in the provision of aircraft components as required. Also, in the late 1990s, support for, and availability of, the F-111s were impacted for several years by changes in logistic arrangements. Logistic managers of the fleet had to focus on the transition[70] from in-house provision of logistic support to arrangements with contractors.

3.22 On the data available to the ANAO, the lowest availability of F-111s occurred in July 2002, with only a quarter of the required number of aircraft being available. The ANAO found that Air Force undertook a number of successful measures to improve serviceability of the F-111 fleet, including a program to replace the wings of all aircraft by the end of 2003, remedying faulty cabling, and detecting and fixing fuel leaks through safer means.[71]

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[69] *Defence Annual Report 2001–02*, p. 109.

[70] Including preparation for a Request for Tender, evaluation of tenders and contract award and managing the transition processes from one source of supply to another, which impacted on aircraft availability.

[71] This included innovations such as helium tracking of leaks and the use of thermo-reactors to reduce curing times from several days to a matter of hours.

3.23 In 2002–03, the F-111s' RoE increased by nine per cent to a level just above that achieved two years earlier. The achieved RoE in 2002–03 was seven per cent higher than planned because improvements in the F-111 aircraft availability occurred faster than expected. By the end of 2002–03, F-111 aircraft availability had improved sufficiently for the F-111 fleet to meet the CPD's short term preparedness requirements. However, the CPD's requirements regarding the maintenance of core skills and professional standards still were not fully met in that year.

3.24 At the beginning of 2003–04, aircraft availability in the F-111 had improved to the extent that the requisite number of serviceable aircraft was available, with some capacity to exceed that number. Reflecting improved aircraft availability, the planned 2003–04 RoE of 3 800 hours for the F-111s constitutes an increase of 46 per cent against the RoE planned for the previous year, and 37 per cent over the achieved RoE in 2002–03.

3.25 Air Force estimates that, over the last decade, operating costs for the F-111 have risen by about six per cent a year. It expects those costs to continue rising at a compounding five per cent a year until the aircraft is taken out of service.[72] The ANAO understands that logistic funding for the F-111 fleet has been increased by $17.3 million in 2003–04. In discussions during the audit, Air Force's logistic manager for the F-111 fleet expressed confidence that this increase in logistic funding, together with a programmed smaller increase in 2004-05, would be sufficient to meet planned RoE.

Flying training hours

3.26 Table 3.2 shows the number of flying training hours for F-111 aircrew planned and actual since 1990–91.

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[72] See *Hansard*, House of Representative, 13 May 2003, p. 14265 and JSCFADT Defence Subcommittee, 15 December 2003, p. 50.

Table 3.2

**F-111 fleet: Planned and actual aircrew flying training hours
1990–91 to 2002–03**

Year	Planned hours	Actual hours	Variance
1990–91	2 750	3 370	+620
1991–92	3 035	3 036	+1
1992–93	2 680	3 349	+669
1993–94	2 690	3 251	+561
1994–95	2 680	3 000	+320
1995–96	2 680	2 781	+101
1996–97	2 560	2 680	+120
1997–98	2 893	2 949	+56
1998–99	2 570	3 084	+514
1999–2000	2 570	2 683	+113
2000–01	2 227	1 883	(344)
2001–02	1 900	1 807	(93)
2002–03	1 900	2 342	+422

Sources: Compiled by the ANAO from information in Defence Annual Reports and data provided by
Defence.

3.27   Positive variances shown in Table 3.2 are mainly due to the transfer to training hours when planned commitments, such as assistance to other parts of Defence in their exercises, were cancelled. A comparison of Tables 3.1 and 3.2 shows that the two negative variances in Table 3.2 (that is, non-achievement of planned flying training hours) occurred in the two years in which achieved RoE fell most severely short of the planned figure (2000–01 and 2001–02).

3.28   Training for F-111 aircrew dropped by more than 1 000 hours from the early years of the 1990s to those of this decade. Recovery of F-111 aircraft availability is reflected in the planning figures for 2003–04, which shows significant increases in flying training hours as well as for other F-111 flying tasks. For 2003–04, the planned 2 612 flying training hours are close to those planned 10 years earlier. If achieved, they amount to 80 per cent of the achieved hours 10 years earlier, a notable improvement compared to the previous two years (for 2000–01, the equivalent would be 56 per cent, and 60 per cent for 2001–02).

3.29   Air Force's remedial measures on the F-111 fleet improved aircraft availability by late 2002 sufficiently to meet the short term CPD requirements.

Hornet aircrew preparedness

3.30   Table 3.3 shows the RoE of the *Hornet* fleet since 1990–91.

Table 3.3

Hornet fleet: Planned and actual RoE, 1990–91 to 2002–03

Year	Planned hours	Actual hours	Variance
1990–91	11 581	12 047	+466
1991–92	11 650	11 651	+1
1992–93	11 634[a]	11 598	(36)
1993–94	11 800	11 726	(74)
1994–95	11 800[b]	12 147	+347
1995–96	12 660[c]	12 423	(237)
1996–97	13 000[d]	11 747	(1 253)
1997–98	12 000	12 008	+8
1998–99	13 020	12 457	(563)
1999–2000	13 270	11 740	(1 530)
2000–01	13 000	12 331	(669)
2001–02	13 000	11 287	(1 713)
2002–03	12 500	14 077	+1 577

Notes: (a) Revised during the year to 11 588 hours.

(b) Revised during the year to 12 165 hours.

(c) Revised during the year to 12 460 hours.

(d) Revised during the year to 12 000 hours.

Sources: Compiled by the ANAO from information in Defence Annual Reports, Portfolio Budget Statements, Portfolio Additional Estimates Papers and *Hansard*.

3.31   The Defence Annual Reports since 1990–91 indicate that the *Hornet*s generally met short term military preparedness requirements.

3.32   The 1999–2000 ANAO audit report on *Tactical Fighter Operations* noted that the *Hornet* FEG had developed its own longer term military preparedness goals in respect of the number of serviceable aircraft and fully trained crew, but had never met these.[73] Defence agreed to the ANAO's recommendations in that report that the military preparedness requirements of the FEG be reappraised.[74]

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[73]   ANAO Audit Report No.40 1999–2000, op. cit., p. 12.

[74]   See Recommendations Nos 2 and 5 in Appendix 1.

3.33 The preparedness requirements for the *Hornet*s have since been revised, and Air Force has incorporated these requirements in the pilot categorisation scheme.

3.34 Defence assessed that the *Hornet* fleet met the short term CPD requirements in 2001–02 and 2002–03.[75] The ANAO's audit evidence, including comparisons of preparedness requirements against the number and experience levels of aircrew, the number of available aircraft and trends in their serviceability, lent support to Defence's assessment for 2002–03.[76]

3.35 In respect of the longer term CPD requirement to maintain core skills and professional standards across all warfare areas, the *Hornet* fleet only partially achieved that requirement in 2001–02.[77]

3.36 For 2002–03, Defence assessed that the *Hornet*s had 'substantially achieved' the above requirement and that, by the end of that year, the *Hornet* fleet fully met the CPD's requirement for MROs with a warning time of less than 12 months, and had 'substantially achieved' the CPD's requirement concerning core skills and professional standards.

F-111 doing a fuel dump and burn.
Source: Department of Defence

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[75] See *Defence Annual Report 2001–02*, p.109, and *Defence Annual Report 2002–03*, p.156.

[76] In this audit, the ANAO did not seek to validate Defence's assessments on the military preparedness for earlier years. Also, to keep the audit within manageable boundaries, its scope did not include a detailed examination of sustainability aspects of logistics and munitions.

[77] *Defence Annual Report 2001–02*, p. 109: *Training levels to maintain core skills and professional standards were achieved. Ongoing delays by the contractor in the delivery and initial support of the lead-in fighter limited fast-jet aircrew training throughput and support to the Navy and the Army.*

4. Case Study: *Hornets'* Middle East Deployment

The ANAO conducted a desk review of the deployment of a Hornet squadron to the Middle East in 2003. This chapter discusses the deployment, including preparatory activities undertaken in Australia, and issues related to the support provided to the deployment.

Background

4.1   Operation *Bastille* is the name given by Defence to the predeployment of ADF forces to the Middle East area of operations in support of potential future operations against Iraq.[78] The predeployment (including preparatory activities in Australia) occurred from January to March 2003.[79]

4.2   The 14 *Hornet* aircraft and their aircrew were provided by 75 SQN, which was augmented by aircraft, aircrew and ground personnel from within ACG to meet the expected requirements of the deployment. Those were above the Squadron's short term preparedness requirements.

4.3   Unit planning for the deployment began in December 2002. Unit records indicate that early, comprehensive briefings by higher level commands on the nature of the operations envisaged allowed the Squadron to undertake well-focused unit planning. Planning at unit level was complemented by ACG staff at Coalition Headquarters assessing what numbers of aircraft and aircrew would be required to meet the operational tasks envisaged.[80]

4.4   In January 2003, the Squadron personnel (including personnel seconded to it from other Air Force units) commenced training for the deployment. That training included a week of general force preparation for operational deployment overseas, followed by three weeks' intensive flying, focused on the skills required in the potential operations against Iraq.[81] The

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[78]   *Defence Annual Report 2002–03*, p. 98.

[79]   Operation Bastille included elements from Australian National Headquarters; Army special operations; Navy elements including two frigates, an amphibious landing ship and a clearance diving team; and aviation forces including three Chinook heavy lift helicopters, two C-130 transport, two P-3 Orion maritime patrol and 14 *Hornet* aircraft.

[80]   The number of *Hornet* aircrew deployed is classified. It included staff seconded to a mission planning cell in allied headquarters. Post-operational reporting by 75 SQN indicates that the right number of aircrew was deployed to meet the tasks.

[81]   The emphasis was on counter air and close air support operations.

training was assisted by other elements of ACG[82], including F-111 aircraft, and Army (for air-to-ground training).

4.5 The weekly hours flown by the Squadron during these three weeks was over 75 per cent above the weekly average flown, representing a significant ramping up for both aircrew and ground personnel. The ability of flying support services such as air traffic control to accommodate this increase confirms other evidence in this audit that, despite personnel shortages in some specialist areas, ADF personnel achieved the operational and training objectives.

4.6 Squadron personnel and aircraft deployed to the Middle East in February 2003 and trained to meet their role in the Coalition's air combat force.[83] In the four weeks of training, the average weekly flying effort was about twice the Squadron's normal weekly average. Flying training included familiarisation with the geographic area, air-to-air combat, strike and close air support.

4.7 In Operation *Bastille*, the Squadron flew 1 027 hours. The Squadron's commander assessed that aircrew were combat ready[84] when Operation *Bastille* transitioned to Operation *Falconer* in March 2003.

Operation *Falconer*

4.8 Operation *Falconer* is the Defence title for its contribution to the US led Coalition operations against Iraq. Operation *Falconer* ceased in July 2003.[85] Air Force's *Hornet* detachment concluded flying operations in early May 2003 and was returned to Australia over the period 12 to 22 May 2003.[86]

4.9 The Squadron's combat flying constituted a large increase in its RoE. The ANAO estimated that during the seven weeks of combat flying, the Squadron flew about four times its normal weekly flying hours.

4.10 Supply of some munitions was available from Coalition sources, but most of the increased logistic support (such as parts, servicing and repair) necessary to support the higher RoE was provided from within Australia's

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[82] 75 SQN documents state that 'aircraft support from other 81 Wing squadrons was instrumental in supporting an expanded squadron program'.

[83] The Squadron was deployed as an Australian tactical unit, to form part of the Coalition's 379th Air Expeditionary Wing.

[84] In Defence's preparedness terminology, they had reached the Operational Level of Capability.

[85] *Defence Annual Report 2002–03*, p. 97.

[86] Minister for Defence, Senate Question on Notice, *Hansard*, 11 August 2003, p. 13083.

Defence resources.[87] Defence investigated the use of alternative sources for the provision for aircraft spares and repair in the area of operations, but shortages of the same spares experienced by those sources and differences in aircraft configuration precluded their use. As the *Acquisition and Cross Servicing Agreement* between Australia and the US excludes precision-guided munitions, chaff and flares, Australia had to initiate contingency cases under the US Foreign Military Sales system for the supply of such items from US forces in the operational theatre.

4.11   Defence's planning and action for the *Hornet* deployment to the Middle East took into account the requirements of what was expected to be a harsh operating environment. Significant efforts were made to protect equipment and aircraft through canopy weather seals, the manufacture and fitting of dust covers for susceptible equipment, and servicing practices to manage and prevent sand penetration.

4.12   A sizeable store of aircraft parts helped sustain high rates of flying. However, post-operational reporting by the Squadron indicates that significant cannibalisation[88] between airframes was necessary to supplement the store of parts held in the operational area.[89]

4.13   Limited airlift capacity seems to have contributed to delays in delivery of supplies to the area of operations. However, diplomatic clearance requirements were the major factor in increasing supply times involving so-called *items of special interest* (items ranging from weapons, ammunition, communication and photographic equipment, to batteries and fire extinguishers). Those requirements added about 14 days to resupply times.[90]

4.14   Delivery times for highest priority aircraft parts ranged from 16 to 20 days in the early stages of the ADF deployments to the Middle East. This was reduced to, typically, six to 10 days in the later stages as initial problems

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[87]   Coalition support as part of the base support was available. 75 SQN's post-operational reports stated that 'exceptional support was noted from all Coalition agencies, particularly contributions to our safety, comfort, working and domestic accommodation, recreation and messing' [provision of meals]. Australia also was able to provide assistance to allies. Australia's Aircraft Battle Damage Repair capabilities was not required to be used for the *Hornets*, but was utilised on an allied aircraft.

[88]   'Cannibalisation' refers to the removal of serviceable components from one aircraft to replace an unserviceable part in another one. It usually is an emergency measure in a situation of parts shortage. Cannibalisation allows a designated aircraft to undertake an operational task. The process of removal of the part, installation into another aircraft and fitting of a replacing part in the aircraft which was cannibalised takes significant maintenance resources and is inefficient.

[89]   An exhaustive analysis of why there arose a need for cannibalisation was outside the scope of the audit. Defence's reviews of Operations Bastille and Falconer indicate that there is a need to determine, on a sound basis, the levels of stockholdings which should be sent with deploying units. The need for Defence to complete work on a practicable stockholding policy is mentioned later in this chapter.

[90]   *An Evaluation of ADF Logistic Support to Operations in the Middle East with a View to Informing Future Logistic Capability Development*, Report for the Vice Chief of the Defence Force, by Air Vice-Marshal C. Hingston, September 2003 (referred to as the *Hingston Report*), Annex K, para. 5.

were solved. In the case of the *Hornets*, longer than usual resupply times contributed to significant cannibalisation of aircraft, therefore increasing the required maintenance effort in the operational area.

4.15 Deficiencies emerged in the deployable logistic management systems. The Squadron's post operational reporting on the deployment to the Middle East, stated that:

> the logistic data management systems available for the operation were adequate but not good, with core functionality for SDSS[91] being turned off and trial software never operating as intended. Data correlation across several unrelated data systems, or investigations into the location of spares within the pipeline is not a field activity. A robust, integrated data management system is necessary to enable field commanders to generate rapid answers to simple questions.

4.16 Aircraft availability of the *Hornets* was high until early April. The number of fully mission capable aircraft fell to a low of less than half the average number available in March. The drop in aircraft availability can be attributed, in large measure, to failure in one aircraft component.[92] A limited number of replacements arrived in mid-April, and aircraft availability recovered significantly by the end of April, although not to the level averaged in March.

Operations' military requirements

4.17 Defence documentation indicates that the Squadron, with few exceptions, carried out the flying missions required of it. The low percentage of missions which were cancelled because of maintenance factors indicated that they were generally not the reason for mission cancellations[93] for the Australian *Hornets*.

4.18 The Squadron's analysis of the operations conducted in the Middle East indicates that the vast majority of missions were successful, and that pilot error

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[91] The Standard Defence Supply System (SDSS) is the primary means for ADF units to obtain supply of logistic items (except for explosive ordnance and non-military classes of supply). ANAO's Report No. 38 2001–02, *Management of Australian Defence Force Deployments to East Timor*, discusses SDSS's use in the ADF's deployments to East Timor. The lessons to be learnt in that report (pp. 15 and 88) noted that 'the need for a responsive and effective logistic system with stamina is accepted by Defence. Defence will need to assess how well the logistic systems, processes and structures in place meet the military planning requirements set by Government'.

[92] Defence's investigation of the circumstances leading to the problems in availability and serviceability of that component indicates that the difficulties were due in large measure to a change, at short notice, in the priorities of the operational tasks to be performed of the *Hornets* from the standard priorities on which logistic planning and resourcing had been based. In any case, force structure and logistic planning and resource decisions dating back several years before the deployment largely determined the number and state of serviceability of the aircraft component in question, at the time of the deployment.

[93] Other reasons for mission cancellation include annulment by superior Headquarters, weather and air traffic congestion.

was rarely the cause for failure in achieving the intended military objective. That analysis also indicates that, at the least, the Squadron equalled the results of other allied combat units in the employment of particular weapons.

4.19   Post operational reporting by the Squadron attributed its success in meeting the requirements of a significant increase in RoE to 'highly professional maintenance staff, a large initial store of aircraft spares and a moderately robust resupply chain'. The Squadron also acknowledged 'responsive and timely support to operations' by DMO's Tactical Fighter Systems Program Office.

4.20   The ANAO also noted that, prior to departure, scheduled aircraft maintenance was brought forward to ease the workload in the area of operations. The *Hornet* logistic support workforce in the Middle East changed from three eight-hour shifts a day to two 12-hour shifts for most of that workforce. Squadron reports indicate that this caused fatigue, particularly in trades which had staff shortages, but enabled the completion of larger servicing work in one shift.[94]

4.21   Preventative measures taken by the *Hornet* element for the environment to which they were deployed appear to have been effective. The expected significantly greater wear on components due to dust and sand did not eventuate.

4.22   Although the *Hornet* fleet had an increased RoE as a result of the deployment, with consequent wear and tear on aircraft components, the type of flying in the operation was less demanding on the airframes[95] than normal training and exercise flying. As a result, Defence considers that the deployment has not shortened the planned life of type of the aircraft.

Implementing the lessons of operations

4.23   The ADF Activity Analysis Database System is to record actions and recommendations arising from significant ADF exercises and operations. Entries into the system did not appear to be made systematically and in a timely way by, or on behalf of, ACG operational units. They were largely unaware of the System's existence and not linked to it. The deployed Squadron has useful information on lessons to be learnt from Operations *Bastille* and *Falconer*. The ANAO understands that these were shared in interchanges within ACG and with Air Command. However, some of the experiences and the lessons to be learnt, identified by the Squadron (on logistic support arrangements, for example), should be seen in the context of problems

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[94]   It should also be noted that 75 SQN's maintenance workforce was augmented for the deployment.

[95]   Although they were prepared for air-to-air combat, in the event, the *Hornets* did not have to engage in it. Furthermore, lower-demand transit flying times were longer.

encountered in previous ADF deployments and should be addressed in a broader Defence context.

Lessons to be learnt from the ADF deployments to East Timor

4.24   ANAO's audit report on the ADF deployments to East Timor pointed out deficiencies in Defence logistic training, systems, processes and structures and the need for Defence to assess how well its logistic arrangements met military preparedness requirements.[96]

4.25   Defence's report, in September 2003, on *Lessons arising from Operations Bastille and Falconer,* indicates that, although ADF operations were successfully conducted, problems encountered in previous ADF operations have persisted. The particular areas of concern related to the:

- lack of responsiveness to end users in theatre joint logistics;

- lack of coordination in logistic information management;

- inadequate logistic training and experience of Defence personnel; and

- lack of an accurate and efficient personnel tracking system.

4.26   The *Hingston Report* on the performance of Defence logistics in the 2003 Middle East deployments concluded that logistic support to those deployments 'was undoubtedly successful overall' but that 'the overall impression gained was that winning the logistic war had more to do with intensive crisis management than a well structured approach to planning.'[97]

4.27   The *Hingston Report* stated that the establishment, in the wake of the ADF's experience in East Timor, of the position of Commander Joint Logistics and of the Joint Logistics Command led to measurable improvements in planning, support and coordination of ADF operations. However, the effectiveness of the new structures was constrained by confusion over roles, relationships and responsibilities for ADF logistics support of the operations from outside the operational theatre.

4.28   That confusion seems to be due to the absence of clear and appropriately disseminated policy guidance to the ADF logistic community and its customers on the roles of the various military commands, DMO and its constituents (including Joint Logistics Command).[98] In respects of logistic

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[96]   ANAO Audit Report No.38 2001–02, *op. cit.,* pp. 15–16. The scope of this audit did not include a follow-up on the lessons to be learnt from previous ADF deployments. The audit work included a desk top review of logistic and administrative issues arising from support of the *Hornets* deployed in Operations *Bastille and Falconer.*

[97]   *Hingston Report,* op. cit., Annex B, para. 1.

[98]   *The entire system suffers from the resulting blurring of responsibilities as individual organisations struggle – but not in unison – to make it work.* (ibid, para. 164).

procedures, participants in the logistic support of the operations mentioned lack of clarity and comprehensiveness in instructions, delays in their development, inadequate dissemination and overly high security classification as issues to be addressed.[99]

4.29 The ANAO's audit report on the management of the ADF's deployments to East Timor pointed out a number of persisting deficiencies in logistic systems, including:[100]

- unreliability of data and lack of trust in the logistic system leading to duplication of demands and exaggerated priority ratings which put additional strains on the supply system;

- duplication of work by inputting data manually on more than one logistic management system such as SDSS and the Lotus Notes Interim Demand System (LNIDS);[101] and

- lack of visibility of items in the supply chain partly because of faults in the Cargo Visibility System (CVS), arising largely from incorrect use of CVS or failure to use it at all.

4.30 The *Hingston Report* indicates that all of the above-mentioned deficiencies reemerged in the operations in the Middle East. The reasons for this included the following:[102]

- little progress seemed to have been made since 2001 in the planning and testing of the architecture for the deployed logistic information systems.[103] The SDSS architecture introduced the concept of Joint Operational Districts, designed to support expansion in the number of force elements, and their movement within, the operational areas. This was a definite improvement over previous arrangements, but it had to be developed and tested 'on the run', as it was rolled out in the field;

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[99] ibid., pp. 43-44 and Annex P, para. 45.

[100] ANAO Audit Report No. 38 2001–02, op. cit., pp. 65, 68, 70, 87

[101] LNIDS is a Lotus Notes based logistic system, deployable for use in operational areas using satellite communications. It is used typically for the supply of items for which there is no authorised entitlement for units.

[102] *Hingston Report,* op. cit., Annex O, pp. 2-7.

[103] However, the ADF's deployments to the Middle East showed improvement in allocating and establishing communications equipment for deployed logistic systems.

- inadequate training and exercising (particularly in a joint environment) of users and therefore lacking user familiarity with, and acceptance of, systems and procedures;[104]

- deployed systems were still in the development stage, with computer hardware suffering intermittent failures partly due to inadequate environmental protection against heat and sand, software configuration problems and interface breakdowns between mainframes and peripherals; and

- inadequate system integration (one way interface only between SDSS and CVS, requiring manual intervention to receive demands;[105] no linkage between LNIDS and SDSS) and between the deployed logistic information system and the movement system, necessitating time consuming and resource-intensive manual transfer of consignment details, and the risk of errors.

Stockholding policy

4.31   ANAO's audit on the ADF's deployments to East Timor pointed to the need for work carried out in Defence, at the time, on ADF stockholdings in deployable units and national storage centres to be brought to a useful conclusion. The audit report also noted that significant effort was still required to establish a practicable Defence stockholding policy to guide that work. Defence's reviews of the Middle East deployments indicate that progress on these matters has been slow.

Recording of personnel in the operational area

4.32   The ANAO report on the ADF deployments to East Timor stated that 'Defence needs an effective and efficient system for recording the movement of personnel into an area of operation, and a clear strategy on how to establish such a system'.[106] The *Hingston Report* noted that no such system was in place in the Middle East area of operation and found no evidence that such a system was on its way.[107]

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[104] Deployable Logistic Information System Support Teams were sent to ensure that hardware and software was configured correctly for users. Although they did much to mitigate difficulties in setting up systems, after the teams' departure, users turned out to have an insufficient capacity to operate the systems. Indications that users could have made better use of the SDSS/CVS Helpdesk emphasise the importance of enhanced training and exercising *before* operations.

[105] This is to be remedied by Defence's In Transit Visibility project

[106] ANAO Audit Report No. 38 2001–02, op. cit., p. 16.

[107] *Hingston Report*, op.cit., p. 52.

Financial management and procurement

4.33 The ADF personnel deployed to East Timor noted a need for pre-deployment training covering financial and procurement matters, as there was significant confusion about delegations and the accompanying procedures.[108] The *Hingston Report* found that in the Middle East deployments, the skill levels of Defence personnel required to undertake financial management tasks varied from the advanced to the uninitiated. Unit level financial skills were found wanting, which was compounded by inadequate financial guidance. The ANAO considers that there needs to be greater and early involvement of Defence's Chief Financial Officer's organisation in operations to provide adequate financial guidance, planning, assistance and training and that Defence ensures that deployed personnel receive adequate financial and administrative training.

4.34 Defence recognised during the East Timor deployments that the guidelines in the Defence Purchasing Guidelines in place at the time were not suited to an operational environment.[109] In 2001, Defence introduced the Rapid Acquisition Program (RAP) to provide a means of accelerated procurement to quickly remedy operational deficiencies to meet immediate security challenges. RAP has been used to prepare ADF elements in the War against Terror and in Operations *Bastille* and *Falconer*.

4.35 Defence documents indicated that, as at September 2003, RAP had been used for the procurement of items to the value of $202 million. The *Hingston Report* concluded that RAP was valuable in broadening the option for Government to provide support to ADF operations, but that better structures, policy guidance and procedures should be developed for the program, including aspects such as:

- ownership and stewardship of RAP to verify that skill sets and structures for its management are appropriate ;

- limiting the scope of the project to off the shelf items and capabilities requiring development work that can be achieved within the requisite timeframe; and

- ensuring that, following the completion of the operations for which RAP capabilities have been acquired, an assessment is made on whether the capability should be retained, and if so, provision be made for through life support.

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[108] ANAO Audit Report No.38 2001–02, op. cit., p. 99.

[109] *Hingston Report*, op. cit., p. 85.

4.36   The September 2003 Defence report on the Middle East deployments concluded that the Defence evaluation process should be examined further, for incorporation in future operations, including integration of the lessons learnt database into planning processes and formal historical recording processes.[110] The ANAO considers that, in addition, there would be benefit in Defence instituting a system of regular reporting to its senior governance committees on progress made in overcoming logistic and administrative deficiencies identified in the evaluation of significant Defence operations.

Recommendation No.2

4.37   The ANAO recommends that Defence:

(a)   review the effectiveness of the Rapid Acquisition Program to ensure it operates within an appropriate framework; and

(b)   monitor, through periodic reviews in its senior governance committees, that adequate progress is made in overcoming logistic and administrative deficiencies identified in significant military operations.

Defence response

4.38   Agreed. The Hingston Report, an evaluation of ADF logistics support to operations in the Middle East, shows that Defence is already addressing the issue of rapid acquisitions and other deficiencies in deployments. The Report identified 81 key issues, proposed 43 lessons learned and offered 90 recommendations. These recommendations are currently being implemented.

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[110]   *Defence Report of Lessons Arising from Operations Bastille and Falconer*, op.cit., Annex B, p. 11.

Support crews preparing *Hornets* for missions over Iraq.

Source: Department of Defence, *The War in Iraq - ADF Operations in the Middle East in 2003*.

5. Future Aircrew Requirements

This chapter outlines the present state of the operational combat aircrew workforce and discusses measures taken or planned by Air Force to meet Australia's requirements for combat aircrew in the future.

Background

5.1   Air Force has experienced pilot shortages since the 1980s. Significant deficiencies in both F-111 and *Hornet* aircrew workforce persisted into 1999–2000.[111] In early 2001, Air Force initiated a Pilot Sustainability Study (PSS) to identify the issues affecting Air Force's pilot workforce and recommend action to improve the health of that workforce. The scope of the PSS was consistent with a recommendation in the ANAO's 1999–2000 audit report on *Tactical Fighter Operations* for Defence to formulate and implement a fighter pilot workforce plan.[112]

5.2   The PSS project team completed a report in November 2001, titled *Strategy for a Sustainable Pilot Workforce.*[113] Important aspects of the report relate to the pilot workforce size and structure, and the annual number of pilots to be trained by Air Force.

5.3   In late November 2001, the Air Force had a target of 57 pilots to graduate each year. That target was derived from a 1995 Air Force study.[114] It was based on a model (referred to as the *Nixon Model*) designed to support a proposed senior pilot officer structure of about 190 Squadron Leaders and 80 Wing Commanders (actual strengths at the time were about 155 Squadron Leaders and 60 Wing Commanders). The pilot senior officer structure was to be maintained by a junior officer pool of 509 pilots.

5.4   The Chief of Air Force Advisory Committee (CAFAC) considered the PSS project team's report in November 2001. The CAFAC agendum identified problems in the pilot workforce structure as a major contributing factor affecting the sustainability of the pilot workforce. In particular, management of the large junior officer pool was largely driven by the need to fill non-flying senior rank positions, where pilot qualifications were not necessarily essential.

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[111]   See *Defence Annual Report 1999–2000,* pp. 226, and 231.

[112]   See Recommendation No.9 in Appendix 1.

[113]   *Strategy for a Sustainable Workforce*, Defence documentation, November 2001.

[114]   *A Report on the Pilot Training Study-1995*, Group Captain M. J Nixon, 1995.

5.5   Following approval from the Deputy Chief of Air Force, non-flying Peacetime Establishment (PE)[115] of the pilot workforce, and consequently total size of the pilot PE, were reduced. Defence considers this an important initiative for pilot retention, given the preference by most pilots for postings to flying positions.

5.6   Defence records indicate that, in late November 2001, Air Force had a PE of 389 junior officers, 117 Squadron Leaders, and 50 Wing Commanders, and that actual personnel strengths for those ranks were 420, 120 and 60 respectively.

5.7   The annual pilot graduation target had not been modified to reflect the changes that had occurred in Air Force's pilot workforce over time, both in the numbers of PE and actual personnel strengths. Furthermore, that pilot graduation target had failed to deliver the numbers of junior pilot officers set as the Air Force requirement.

Number of trainee pilots

5.8   Resignations rates are a major factor in determining the number of operational air combat pilots to be trained. The resignation rate of Air Force pilots rose from less than five per cent in 1993–94 to a peak of 13 per cent in 1995–96, again dropping to less than five per cent in 1999–2000 and climbing to 13 per cent in 2000–01. The separation rate then dropped to six per cent in 2001–02 and four per cent in 2002–03.

5.9   Defence advised the ANAO in January 2004, that determining fast-jet separation rates was a difficult task, requiring manual allocation of members to aircraft types. This was increasingly difficult as members moved from operational squadrons to staff positions. Considerable staffing efforts would be required to compile accurate figures on the separation rates of fast-jet pilots as a distinct category. The data available indicated that the number of fast-jet pilots separations a year dropped from 28 in 2000–01 to 14 in 2001–02 and seven in 2002–03.

5.10   The Air Force strategy for some years had been to remedy the shortage of operational fast-jet pilots by maximising the annual number of graduate pilots, thereby seeking to increase the numbers of trainee pilots entering the fast-jet training stream. The short term effect of that strategy was to increase the requirement for pilot instructors, a demand which exacerbated the shortage of the number of fast-jet pilots in operational squadrons.

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[115]   PE reflects the agreed number of personnel positions of various skill sets required to be filled by Air Force to meet its requirements in peacetime.

5.11 There is a structural imbalance between the number of operational fast-jet pilot positions and the demand for fast-jet instructors. On past experience, operational fast-jet squadrons are capable of filling an instructor establishment of a size not exceeding 70 per cent of the number of operational pilot positions. On full staffing, the capacity of the operational squadrons is a quarter below the required number of instructor positions to be filled.[116] On the basis of historical average staffing of the operational squadrons, that capacity shortfall is about 40 per cent.

5.12 The high demand for instructors also impacted on the experience base of the operational squadrons. Their pilots were required to undergo instructor qualification training soon after reaching the requisite flying experience, after about two years of operational flying. That resulted in difficulties in meeting Defence preparedness requirements. ACG also stated that the high demand for instructors, and a resulting lack of flexibility available in pilot career management, was a negative factor in pilot retention.

5.13 The PSS report queried the validity of the methodology which had been used to determine the Air Force annual pilot graduation target. It recommended a fundamental change in the way of calculating that target, moving from the previous 'top-down' approach (using the perceived need to maintain set numbers of senior pilot rank positions) to a 'bottom-up' assessment based on military capability requirements.

5.14 CAFAC agreed to the PSS team's recommendation that the Air Force pilot requirement be reassessed with a replacement for the *Nixon Model*. During 2002, Air Force developed a workforce model for pilots, the Pilot Sustainability Model (PSM). At a seminar (chaired by Deputy Chief of Air Force) on the pilot workforce of senior Air Force officers, it was agreed that the PSM appeared to represent a reasonable basis for analysis and remediation of the pilot system.[117]

5.15 The participants at the seminar also agreed that 'an Air Force target of 42 pilots was a more intuitive figure [than the then current 57] given the need to have regard for resources and general absorption' [capacity in FEGs].[118] Further development was to be undertaken on the PSM, aimed at setting a preferred pilot graduation target by the end of 2002.[119]

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[116] ANAO's calculation, based on data in *ACG Weapon Systems Plan*, Workforce Management, ACG Pilot Management Strategy *2003–05*, June 2003, pp. 2–3.

[117] Air Force documentation, *CAFAC Agendum, Pilot Sustainability Project – Final Report*, November 2002, Annex A to Enclosure 2.

[118] This refers to the development in some FEGs where a large number of pilots (compared to available RoE) has led to problems in the ability of pilots to progress their flying skills at a reasonable rate (Air Lift Group flying hours per pilot have reportedly dropped by 40 per cent over 10 years), ibid., p. 6.

[119] ibid., p. A-2.

5.16 CAFAC considered the final report of the PSS project team in November 2002. On the basis of a more refined PSM, CAFAC agreed to implement an interim pilot target of 42 and endorsed a requirement to further enhance the PSM to validate and refine the pilot graduate target. The interim pilot target was close to the 10 year average of 42.5 Air Force pilot graduates actually achieved.[120]

Current status

5.17 Falling Air Force pilot separation rates have been a major factor in Air Force boosting the number of its pilots, including fast-jet pilots, in the last two years. In February 2003, there was a surplus of pilots in the Air Force (Air Force had 671 pilots against a PE of 579).[121] The number of pilots for the F-111 and *Hornet* aircraft were close to full staffing at the time of audit fieldwork. To achieve a sustainable fast-jet pilot workforce, Air Force was carrying out modelling work, discussed later in this chapter. There was still a shortage of F-111 navigators, resulting in an increased workload as the smaller number of navigators had to pair up with a larger number of pilots.

F-111 navigators

5.18 In April 2003, ACG initiated a study to examine how a viable navigator stream could be maintained until the planned withdrawal from service of the F-111s.[122] The study identified major issues involved in the transition arrangements, to help ensure a satisfactory outcome in terms of maintaining required Air Force capabilities and identifying appropriate options for the management of the navigator workforce.

5.19 The study assumed an earliest withdrawal of the F-111s of 2012. The training pipeline for F-111 navigators is over four years. The last Basic Navigator Course to graduate candidates for the F-111 navigator stream would need to run about five years before withdrawal of the aircraft. The last F-111 operational conversion and the last Introductory Strike Navigator courses would need to run about four years before the withdrawal of the aircraft.

5.20 Air Force training plans at the time of audit fieldwork included a significant increase in the F-111 trainee navigator intakes to remedy

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[120] *Strategy for a Sustainable Pilot Workforce*, op. cit., p. 9. The November 2001 PSS project team report notes that with 42.5 pilot graduates a year, the junior officer pilot pool was kept at the required size, (ibid.) Defence advised the ANAO in January 2004, that Air Force's annual pilot graduation target was 42.

[121] Air Force documents indicate that the real surplus was about 15 pilots, when allowance is made for pilots undergoing or awaiting training.

[122] Air Force documentation, *A Study into the Management of the Fast-Jet Navigator Stream during the Transition from the F-111 to a follow-on Single Seat Combat Aircraft*, Officer Commanding 82 Wing.

shortages.[123] The maintenance of preparedness requirements could require the introduction of new training and incentives to provide a balanced F-111 pilot/navigator workforce until the withdrawal from service of the aircraft. ACG was considering the option of qualifying some aircrew as both pilots and navigators as part of transition arrangements for a new combat aircraft.

1 SQN aircrew practise aerial manoeuvres over RAAF Base Amberley.

Source: Department of Defence.

Combat pilots

5.21 The strategic roles to be met by ACG are described in *Defence 2000*. ACG's short term military preparedness requirements are derived from the CPD and met by ACG's operational squadrons.

5.22 The ANAO understands that the number of those squadrons and their pilot PE have been derived by Air Force assessments of how to provide an optimum national air combat capability, over time, given the number of

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[123] F-111 navigators are a targeted specialisation in the Air Force's Labour Agreement.

combat aircraft held, their age and condition, expected date of replacement and resources approved to operate and improve ACG capabilities.

5.23   The structure of ACG's operational squadrons determines the number of operational fast-jet pilots required. That structure, however, is of insufficient size to sustain the number of instructors required to be filled by it to meet Air Force's pilot training requirements.

5.24   During 2003, ACG developed a medium term pilot management strategy.[124] ACG considered the option of increasing the size of the operational pool, but noted constraints limiting the ability to increase RoE. For example, tight schedules for the management of airframe fatigue of the *Hornets* (if they are to reach their planned date of withdrawal). ACG concluded that any increase in training throughput to *Hornet* and F-111 operational units would reduce experience levels and capability overall.[125]

5.25   The priority to fill instructional positions in the past led to fast-jet pilots spending only about two years in their operational posting, before being posted to undergo instructor training and then into an instructor position. This had an adverse effect on both experience levels in operational squadrons and pilot morale.

5.26   To address the structural problem, ACG has been implementing a multi-pronged approach, comprising:

- the formation of two *Hawk* operational flights to provide dedicated support to other parts of Defence, reduce the waiting time of pilots between postings, provide a pilot career option on the *Hawk* and increase the size of ACG's pool of operational pilots;

- continuing lateral recruitment and re-enlistment of ex-Air Force pilots to fill instructor and non-flying positions[126] (ACG has a 2003–04 target of six, against a total Air Force pilot target of eight);[127]

- maintaining up to four reservists as flying instructor staff at each of the two *Hawk* training squadrons (employment of reservists was not considered feasible for the more complex aircraft types because of flying currency requirements);

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[124]   *Workforce Management, ACG Weapons System Plan, ACG Pilot Management Strategy 2003–05*, Commander ACG, June 2003.

[125]   ibid., p. 3.

[126]   ACG's employment policy on laterally recruited aircrew and ex-RAAF aircrew is laid down in ACG Standing Instruction Operations 2-2, April 2002.

[127]   *Workforce Management, ACG Weapons System Plan, ACG Pilot Management Strategy 2003-05*, op. cit. p. 4.

- continually reviewing training syllabuses to reduce the volume of instructional tasks (this has been implemented successfully on the *Hawk* Operational Conversion syllabus). From this initiative, a reduction of two to five per cent in ACG's instructor PE was expected to be achieved by 2005;

- further reducing Air Force pilot instructor PE through the employment of civilians in non-flying instructional tasks such as simulator[128] and ground instruction and instructional support; and

- increasing the time spent in instructor positions for selective individuals through the use of the Aircrew Specialisation Option.[129]

5.27 If the ACG targets set out above are reached, the combined effect of increases in ACG's capacity to fill instructor positions and decreased requirements for ACG pilot instructors would result in ACG being able to fill about 95 per cent of the number of required instructor positions (assuming all operational pilot positions are filled). The structural imbalance between the number of operational fast-jet pilots and the number of Air Force instructor positions to be filled would be largely resolved.

5.28 Furthermore, Air Force has continued modelling work on the fast-jet pilot workforce initiated as part of PSS. The approach adopted was to develop a pilot workforce model based on providing the human element of the required military capabilities and to sustain them over time.

5.29 The focus was on meeting the primary military capability requirement in terms of the right numbers of fast-jet pilots, with an experience base to meet short and longer term preparedness requirements. This aimed to have a balance of flows into and out of the system to ensure a reasonable level of quantitative and qualitative stability.[130]

5.30 As a separate exercise, 78 Wing, reviewed training syllabuses and the number of trainees required in the fast-jet training system to meet the requirements of the operational squadrons.

5.31 The conclusion of both reviews indicate that the longer term target of fast-jet pilot graduates per year could be reduced by at least 15 per cent

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[128] An example of this was seen in audit fieldwork on the F-111 simulator.

[129] The Aircrew Specialisation Option is a mechanism that allows Air Force to offer selective aircrew employment tenure and conditions, generally in instructional and staff positions, to meet specific organisational and personal requirements.

[130] *Temporal discipline* was the title given to the model, largely to denote the need to carefully manage the time elements of developing a skilled military workforce, in training, and in building its experience through operational postings.

without reducing capability.[131] On the contrary, a reduction of that order would be likely to lead to a capability enhancement by:

- reducing the number of trainee pilots required in the Air Force pilot system, thereby reducing the need for ACG instructors and also contributing to remedying the structural imbalance between the number of ACG operational pilot positions and the number of instructor positions to be filled;

- allowing longer operational postings of fast-jet pilots and thereby improving the experience base in operational fast-jet squadrons; and

- decreasing the number of marginal candidates accepted into the fast-jet pilot training stream and a decrease in failure rates, which could over time allow a further reduction in the numbers of trainees required to enter the fast-jet training stream and the number of flying instructors required to train them.[132]

5.32 Reducing the annual number of fast-jet pilots to be trained would also help ease other pressures in the pilot training pipeline, additional to the need of filling instructor positions. The P-C9/A aircraft used by 2 FTS are over 15 years old and have availability problems. Although Air Force and contractors are working cooperatively to minimise those, aircraft availability problems have led to a lengthening of training courses.

5.33 The *Hawk* aircraft fleet, used in fast-jet conversion training, has yet to meet the number of hours set in the contract between Air Force and the provider of the aircraft.[133] However, Air Force has managed to meet training requirements through a number of measures, including greater use of simulators and rationalisation of the training syllabuses.

5.34 The ANAO understands that ACG has endorsed fast-jet training numbers in its training system to reflect the modelling done by 78 Wing. At the time of the audit, that reduced requirement was not yet reflected in a change of Air Force's annual pilot graduation target. Furthermore, changes in the planned withdrawal from service of the F-111 fleet as a result of the 2003 Defence Capability Review has implications for combat aircrew training. The

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[131] Figures based on the 'temporal discipline' workforce modelling resulted in a desirable annual target of 19 per cent less than the previous target and 78 Wing's calculation resulted in a reduction of 15 per cent.

[132] The evidence in the audit indicated that the number of pilot trainees willing to join the Air Force and suitable for pilot training has been fairly constant over the years. There was a trend for increases in the number of marginal trainees and failure rates in pilot training in years where the pilot training numbers were raised from the longer term average.

[133] 30 *Hawk* aircraft were introduced into service in 2000–01 and three in 2001–02. The *Hawk* was to provide 9 000 hours of flying a year. In 2001–02, 5 075 hours were achieved, and 6 691 in 2002–03.

long training pipeline requires planning changes and transition arrangement at least four to five years before aircraft are withdrawn.[134]

5.35 The importance of setting the appropriate annual pilot training targets is derived from the distortions that occur if the numbers are wrong. Excess number of pilots in the training program result in resources (both pilots and their training and support) not being used effectively.

Recommendation No.3

5.36 The ANAO recommends that, to help meet the military preparedness requirements for air combat in the future, Defence prepare a comprehensive workforce strategy for combat aircrew and report progress on its development and implementation as part of the Annual Report.

Defence response

5.37 Agreed.

Canberra ACT

25 May 2004

P. J. Barrett

Auditor-General

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[134] F-111 trainees constitute about 27 per cent of the fast-jet trainees under the revised ACG training targets.

Appendices

Appendix 1: Recommendations Relevant to Combat Aircrew in Audit Report No.40 1999–2000 *Tactical Fighter Operations*

Recommendation No.2: The ANAO recommends that Defence determine a longer term military preparedness capability for the Tactical Fighter Group (including the requirements for maintaining core skills).

Recommendation No.5: The ANAO recommends that the Tactical Fighter Group review its definition of Minimum Level of Capability for *Hornet* pilots to ensure it is a useful measure of the Tactical Fighter Group's ability to meet operational requirements.

Recommendation No.6: The ANAO recommends that Defence systematically monitor the progress of trainee fast-jet pilots recruited in the 1998 and subsequent recruiting campaigns to help identify strategies to improve the cost-effectiveness of fast-jet pilot recruiting and training.

Recommendation No.7: The ANAO recommends that Air Force endeavour to raise the pass rates in fast-jet pilot training by:

(a) identifying early Australian Defence Force Academy pilot applicants who do not meet the flying aptitude standards and direct them to other careers;

(b) allowing ADFA cadets to commence pilot training only if they meet the minimum flying aptitude standards; and

(c) making up the shortfall on pilot training courses due to any reduced ADFA component with non-ADFA recruits.

Recommendation No.8: The ANAO recommends that Defence seek to retain a greater proportion of its fast-jet pilots by:

(a) conducting a full review of the Pilot Retention Bonus scheme, possibly including a survey of past and current pilots, to ascertain how to make such a scheme more effective;

(b) targeting any future bonus to pilots who have completed their Return of Service Obligation, whose retention is operationally necessary and who will contribute to filling an identified shortage; and

(c) considering the use of individual agreements or other special arrangements covering pay and conditions for fast-jet pilots.

Recommendation No.9: The ANAO recommends that Defence coordinate its efforts to acquire and retain sufficient numbers of pilots for the Tactical Fighter Group by formulating and implementing a Tactical Fighter Group pilot workforce plan to:

(a) identify and approve authoritative figures for the required *Hornet* pilot numbers across the Defence organisation;

(b) set appropriate recruitment targets and selection processes;

(c) guide research on issues affecting the pilot workforce;

(d) facilitate a greater workforce planning and modelling capacity in relation to fast-jet pilots;

(e) identify key result areas and suitable measures for fast-jet pilot recruitment, selection, training and retention; and

(f) allocate responsibility for implementing, monitoring and evaluating actions under the workforce plan to a discrete functional unit within Defence.

Defence agreed to all of the above recommendations.

Appendix 2: Combat Aircrew Recruitment and Selection Processes

Attraction and selection

To meet the recruitment targets and attract applicants, recruiting campaigns are conducted on an on-going basis. One method of attracting applicants is through advertisements in the media. The advertising budget for ADF aircrew in 2002–03 was $2.5 million (11.7 per cent of the total ADF recruitment marketing budget) and $2.27 million (13.2 per cent of that budget) in 2003–04.

Figure A 2.1 shows the number of enquiries to successfully enlist of one person as an Navy, Army or Air Force pilot. The number of enquiries received for pilot positions in financial years 1998 to 2003 is shown in Figure A 2.2. Due to the public perception that, to fly, Air Force is the Service to join, Air Force received by far the greatest number of enquires (3702 in 2002–03) compared to the number of enquires for a Navy pilot (441 in 2002–03) and Army pilot (864 in 2002–03).

Figure A 2.1

Number of enquiries to successful enlistment of one applicant into a Service

Note: Comparable data for previous years not available.
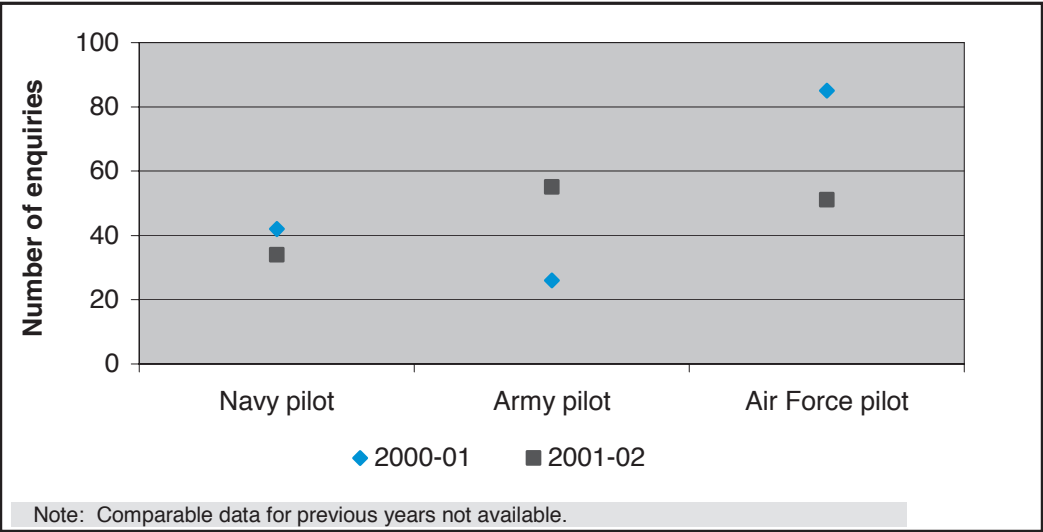
Source: Defence Force Recruiting.

Figure A 2.2

Pilot enquiries by Service 1 July 1998 to 30 June 2003
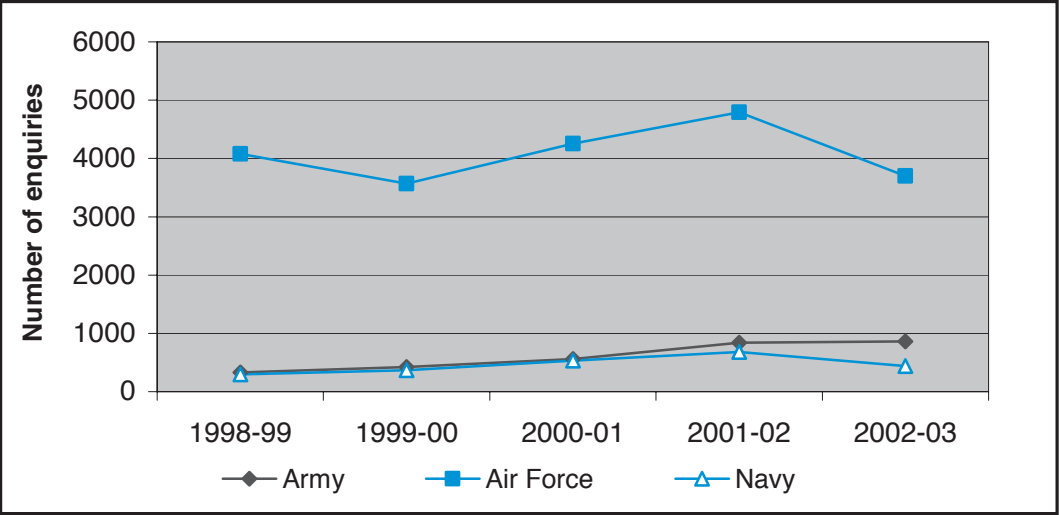
Source: Defence Force Recruiting.

The fast-jet pilot stream was opened up to women in 1992, after the Government announced that women could serve in all positions following a review, *Employment of Women in Combat and Combat-Related Positions*.[135] The only restricted employment areas are those linked directly to some combat operations. As at 30 June 2003, women occupied 2.3 per cent of aircrew positions in the ADF.

Air Force pilot and navigator enquiries received by DFR by gender are shown in Figures A 2.3 and A 2.4 for 1998–99 to 2002–03. The ratio of male to female enquiries for pilot and navigator positions in 2002–03 was 9:1 and 4:1 respectively.

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[135] Since 1992, 85 per cent of employment categories in the ADF have been opened up to women with the current exception of clearance divers, combat engineers, artillery, infantry and airfield defence. The restriction was imposed on women within some employment [combat] areas for occupational health and safety reasons, where use of embryo-toxic substances could endanger their health. In 1987, the first two female pilots graduated from the RAAF pilots course, and in 1990, three RAAF female pilots were employed in combat related roles on C130 aircraft in 36 SQN. There have also been female F-111 navigators at various points in time.

Figure A 2.3

Air Force pilot enquiries by gender received by Defence Force Recruiting: 1998–99 to 2002–03
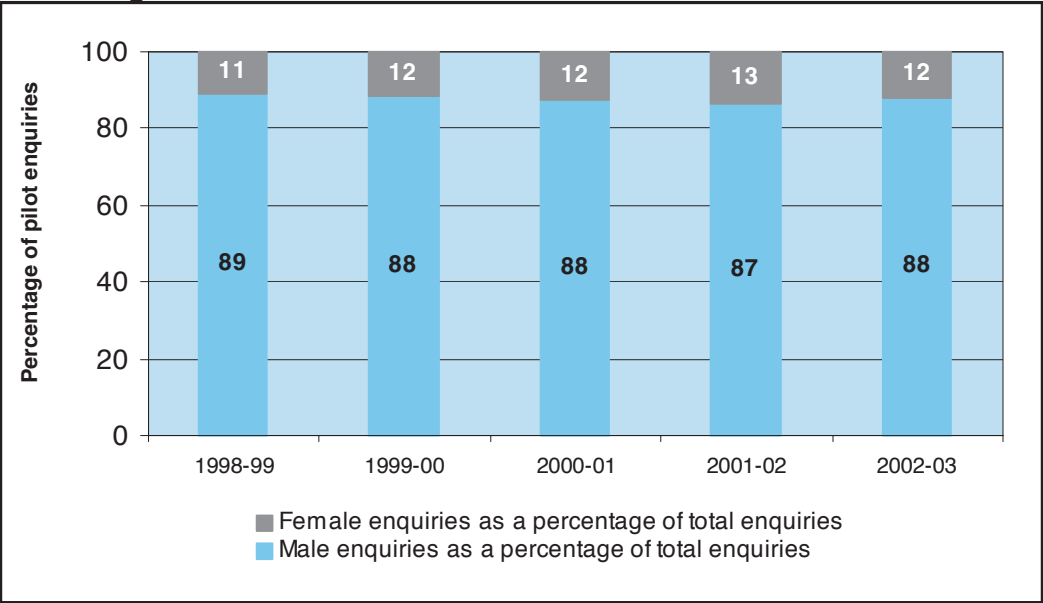
Source: Defence Force Recruiting.

Figure A 2.4

Air Force navigator enquiries by gender received by Defence Force Recruiting: 1998–99 to 2002–03
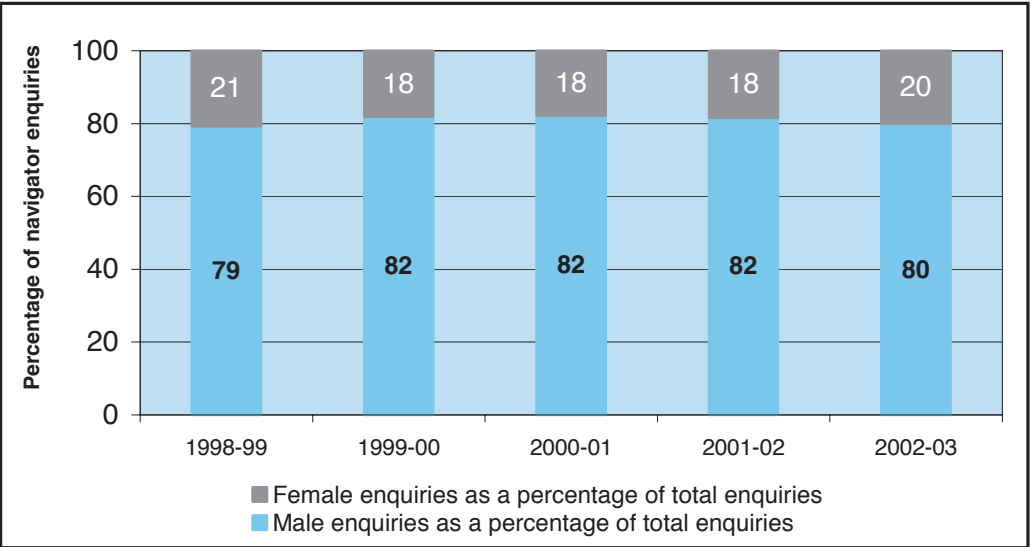
Source: Defence Force Recruiting.

ADF Pilot Selection Agency (ADF PSA)

Applicants who meet initial medical and aptitude standards at DFR centres are transferred to ADF PSA. ADF PSA is provided with the details of 500 candidates by Manpower and a paper selection board is conducted to determine their eligibility for initial training at BFTS. From these candidates, about 275 candidates a year for the three Services are selected for flight screening at ADF PSA. Within a two-week live-in period in Tamworth, trainees are evaluated, based on sorties,[136] flying, leadership qualities and results from the Aircrew Test Battery.[137] A written report by a psychologist and an ADF officer also assists in the ranking of trainees. About 180 candidates (65 per cent of the applicants selected for flight screening) a year are recommended for training. The rest are referred to DFR for other avenues of joining the ADF or rejected. On completion of the live-in period, candidates return to their respective abode.

Students who are recommended for initial training after completing ADF PSA go into the PSA pool (a list of recommended trainees). Students can remain in the pool for up to 12 months, waiting to be selected by a Service for their pilot training programs. The length of time spent waiting in the ADF PSA pool is dependent on the number of positions allocated to pilot courses by the Services and the scheduling of those courses (as individual Services run courses at different intervals). Students of a high standard can expect to be chosen by a Service from the Pool within two to three weeks (subject to the availability of training courses); the waiting time can be two to three months for trainees of an average standard; and up to 12 months for below average trainees.

If they want to remain in the pool, candidates who have not been selected within 12 months are then required to redo the Aircrew Test Battery. The Aircrew Test Battery can be undertaken up to three times. However, very few trainees return for a second attempt because they may have commenced employment or study in the meantime.

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[136] A sortie is an operational flight undertaken by one aircraft for a specific task.

[137] The Aircrew Test Battery aims to assess whether the applicant is suitable for pilot training and is comprised of a series of tests, including instrument comprehension, visualisation of manoeuvres, aviation reasoning, numerical approximation and complex coordinator.

Appendix 3: The Setting of Air Force's Navigator Recruitment Targets

The process of how Air Force develops recruitment targets is shown in Figure A 3.1. The Directorate of Workforce Planning–Air Force conducts modelling to determine recruitment targets under the general entry method into the RAAF. In setting recruitment targets, workforce planners review future establishment requirements for an employment group, forecast separations, training lead-times, capacity and failure rates as well as promotions to the next rank. A draft recruiting target for each employment group is calculated and then reviewed by the Directorate of Personnel Capability Management-Air Force against the Air Force structure to ensure targets are within Air Force strategic guidance. After any necessary revisions, recruitment targets are presented biannually to a Recruit Training Coordination Meeting where targets are considered against the constraints of the recruiting and training process. A draft set of recruiting targets is then given to the Director General Personnel-Air Force for approval.

Figure A 3.1

The setting of Air Force recruitment targets
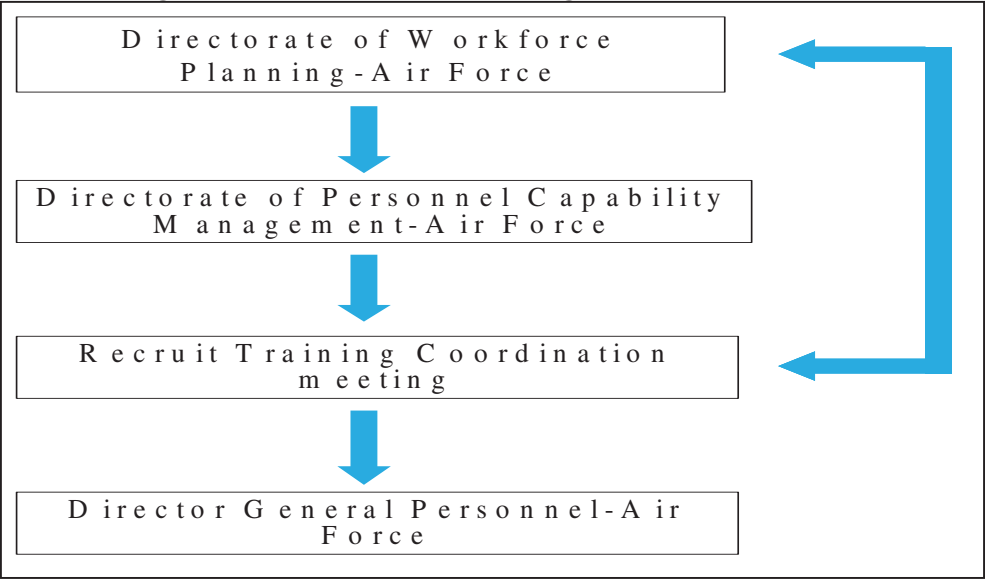
Source: Compiled by the ANAO from Air Force documentation

The targets for navigators were previously set using the modelling process outlined above. However, owing to long training lead times and other factors (such as trainees failing a more comprehensive medical examination in the latter phases of training and changing peacetime establishment requirements) during the period after recruitment and entry into an operational squadron, fewer numbers of navigators were graduating than required.

To alleviate the shortage of navigators, a steady number of personnel to start navigator training was approved in 2002 to be trained each year. The number was set at 20, reducing to 18 from 2004-05 onwards.

Index

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Audit Report No.46
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Army Individual Readiness Notice Follow-up Audit
Department of Defence

Audit Report No.44
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Department of Defence

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Department of Veterans' Affairs

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Department of Defence

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The Senate Order for Department and Agency Contracts
(Financial Year 2002–2003 Compliance)

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Government Agencies

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National Health and Medical Research Council
Department of Health and Ageing

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Audit Activity Report: July to December 2003
Summary of Outcomes

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Management of Internet Portals at the Department of Family and Community Services

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Health Insurance Commission

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Australian Taxation Office

Audit Report No.22 Financial Statement Audit
Audits of the Financial Statements of Australian Government Entities for the Period Ended 30 June 2003
Summary of Results

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Special Employee Entitlements Scheme for Ansett Group Employees (SEESA)
Department of Employment and Workplace Relations
Department of Transport and Regional Services

Audit Report No.20 Performance Audit
Aid to East Timor
Australian Agency for International Development

Audit Report No.19 Business Support Process Audit
Property Management

Audit Report No.18 Performance Audit
The Australian Taxation Office's Use of AUSTRAC Data Follow-up Audit
Australian Taxation Office

Audit Report No.17 Performance Audit
AQIS Cost-recovery Systems Follow-up Audit
Australian Quarantine and Inspection Service

Audit Report No.16 Performance Audit
Administration of Consular Services Follow-up Audit
Department of Foreign Affairs and Trade

Audit Report No.15 Performance Audit
Administration of Staff Employed Under the Members of Parliament (Staff) Act 1984
Department of Finance and Administration

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Survey of Fraud Control Arrangements in APS Agencies

Audit Report No.13 Performance Audit
ATSIS Law and Justice Program
Aboriginal and Torres Strait Islander Services

Audit Report No.12 Performance Audit
The Administration of Telecommunications Grants
Department of Communications, Information Technology and the Arts
Department of Transport and Regional Services

Audit Report No.11 Performance Audit
Annual Performance Reporting

Audit Report No.10 Performance Audit
Australian Defence Force Recruiting Contract
Department of Defence

Audit Report No.9 Performance Audit
Business Continuity Management and Emergency Management in Centrelink
Centrelink

Audit Report No.8 Performance Audit
Commonwealth Management of the Great Barrier Reef Follow-up Audit
The Great Barrier Reef Marine Park Authority

Audit Report No.7 Business Support Process Audit
Recordkeeping in Large Commonwealth Organisations

Audit Report No.6 Performance Audit
APRA's Prudential Supervision of Superannuation Entities
Australian Prudential Regulation Authority

Audit Report No.5 Business Support Process Audit
The Senate Order for Departmental and Agency Contracts (Autumn 2003)

Audit Report No.4 Performance Audit
Management of the Extension Option Review—Plasma Fractionation Agreement
Department of Health and Ageing

Audit Report No.3 Business Support Process Audit
Management of Risk and Insurance

Audit Report No.2 Audit Activity
Audit Activity Report: January to June 2003
Summary of Outcomes

Audit Report No.1 Performance Audit
Administration of Three Key Components of the Agriculture—Advancing Australia (AAA) Package
Department of Agriculture, Fisheries and Forestry—Australia
Centrelink
Australian Taxation Office

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