STATE AIRCRAFT UNIT
VICTORIA

Annual Report 2004-2005

Contents

Manager, State Aircraft Unit message

The State Aircraft Unit was established by the Country Fire Authority and Department of Sustainability and Environment in 2001 after several organisational and administrative difficulties involving the management of aircraft in multi agency operations. The aim of the Unit is to provide a "one stop shop" for aircraft operations across CFA and DSE and to assist personnel from these agencies to manage aircraft in the complex environment of large wildfires and if necessary, other emergencies.

Since 2001 the State Aircraft Unit has evolved into a true multi-agency unit providing support and advice to not only CFA and DSE but also to the Department of Primary Industries, Parks Victoria, VicForests, Melbourne Water and the National Aerial Firefighting Centre. The Unit has a range of personnel to ensure expertise in the various operations. The SAU presides over 3000 hours or more of operations each year. To do this safely and efficiently, the SAU use key areas of delivery in that of Training, Operations, Audit and Analysis, Technical/Equipment, Procurement and Business Management. Currently eight full time staff drawn from CFA and DSE and a part time contract administrator make up the unit workforce.

For the past four years the SAU have been focused on grass roots on-ground support and on winning the confidence of CFA and DSE regions. This report, the first of it's type for the SAU, represents not only the achievements of the 2004/05 financial year, but it tells a story of the efforts of all concerned with making the SAU a success.

The use of aircraft as one of the tools of fire suppression and management is growing in importance both in Victoria as well as in other jurisdictions around Australia. The SAU have played an instrumental role in establishment of the National Aerial Firefighting Centre and have willingly passed on assistance and expertise. In return, Victoria has benefited financially from receipt of over $6million in Commonwealth funding as well as the knowledge that we are making a positive contribution to standards and safety of aerial firefighting operations in Australia.

Aviation training programs offered by DSE and the SAU have set the benchmark for many years in both the firefighting and aviation communities. Aerial firefighting has been given high accolades by media and politicians alike in the past 10 years resulting in more widespread use of aircraft. The demand for aviation training continues to increase as jurisdictions less familiar with the demands of a comprehensive aerial firefighting program, come to grips with the requirements.

In the field of aviation equipment development the SAU are forging ahead. The 2004/05 financial year saw the introduction of the Aviation Equipment Group to monitor and advise on aviation related equipment requirements. A key project of this group has been the research and development of the next generation aerial incendiary machines. Other projects include a bulk aviation fuel tanker, mobile eductor retardant mixers, remote area water tanks and upgraded foam support units. With regards the infra red scanning program, the SAU have been working with the DSE Fire Information Systems Group to develop a new infra red linescanner. A year in the planning and two years in the making, the 2004/05 financial year saw much of the nuts and bolts work completed which will result in a new scanner and scanner aircraft for introduction in 2005/06. This is a major achievement and clearly sees Victoria as the leaders in this field of aerial reconnaissance.

As is normal the procurement and service assurance processes occupy many hours of SAU time each year. The 2004/05 year was no exception with ten fixed wing firebomber services and a new linescan service finalised in the first half of the year as well as commencement of the purchasing process for 14 helicopter services for the 2005/06 season and beyond. Compliance with government procurement procedures is an onerous task but it is a very necessary component of accountability and governance. I am pleased to say that the processes and documentation developed and used by the SAU has laid the foundation for aerial firefighting contracts for many organisations and jurisdictions conducting similar activities including the National Aerial Firefighting Centre. Topical are recent reports from the Australian Transport Safety Bureau (ATSB) that have dealt with recommended procedures and practices for organisations engaging in "campaign" type air operations. The reports were prompted by some serious errors surrounding use of aircraft in locust control operations but the issues raised clearly cross all types of campaign operations, including fire fighting. It would appear that the way in which such operations are conducted in Victoria are already fully in accord with the recommendations of the ATSB. In addition the Australian Plague Locust Commission have sought our expertise in modifying their operations to meet the ATSB recommendations.

The fact that Victoria is at the forefront of aviation services of this type has not been by accident. The Agencies, combined with the SAU, have remained uncompromising on the quality required by service providers. We have implemented accident and incident procedures, operator and aircraft audit/quality assurance processes, analysis of risk programs and sought outside expertise when required. Over the next 12 months it will be imperative that we continue to build on these very solid foundations to ensure the key elements of purchasing, training, review, technology and coordination are delivered to the high standards that are both expected and required.

Finally, I would like to use this forum to thank the SAU members, the agency personnel and the many aircraft operators for their professionalism and support from one season to the next. The SAU have over 280 aircraft registered on the system, supplied by 87 aircraft operators. A clear challenge of the SAU in conjunction with CFA and DSE, is to draw together these many organisations from the varied cultures and backgrounds and require them to operate as one.

Nick Ryan

Governance

The SAU are governed by a two-tier arrangement as follows:

SAU Steering Committee meetings
Members: DSE Director Emergency Management (Chair), CFA Chief Officer, Emergency Services Commissioner.
There were no meetings of the Steering Committee held.

SAU Implementation Committee meetings
Members: CFA Manager State Operations (Chair), DSE Manager Preparedness and Response, CFA Manager Headquarters Operations, Manager State Aircraft Unit.
Three meetings were held this year.

Stakeholders

The SAU is committed to successful service delivery and meeting stakeholders' expectations. We will continue to inform, consult and seek feedback from agencies and communities across Victoria, as part of our dedication to continuous improvement. The SAU prides itself on being at the forefront of aviation training, procurement and management of aviation services and the use of technology.

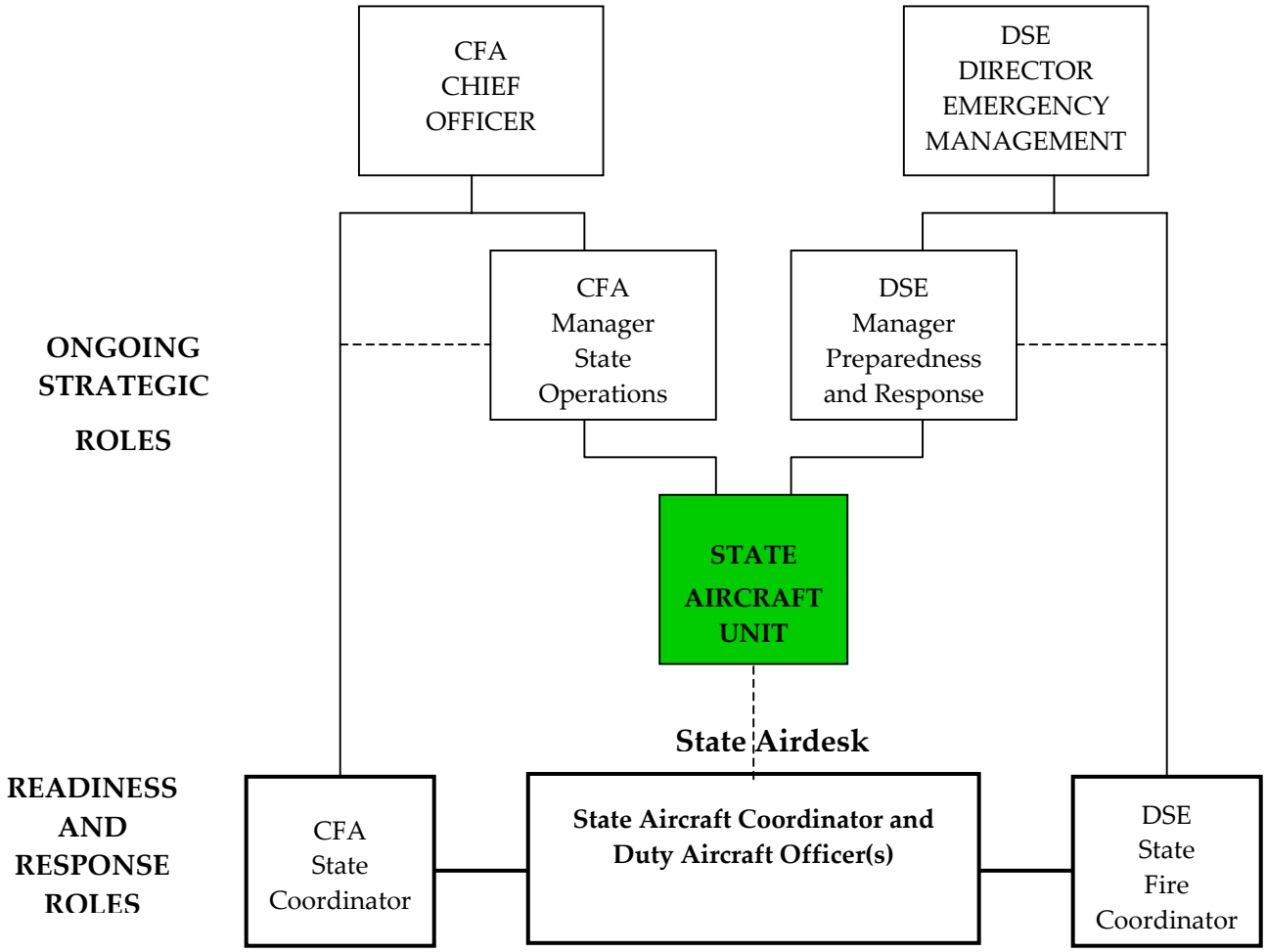
Key stakeholders in the SAU include:

- The Victorian Government, through the Minister for Environment and Minister for Police and Emergency Services, along with Members of Parliament.
- The Country Fire Authority (CFA) and Department of Sustainability and Environment (DSE).
- Victorian fire and land management agencies, including the Melbourne Fire and Emergency Services Board, Department of Primary Industries, Parks Victoria, VicForests and Melbourne Water.
- The Victorian community.
- The Office of the Emergency Services Commissioner.
- The National Aerial Firefighting Centre and the Australasian Fire Authorities Council.

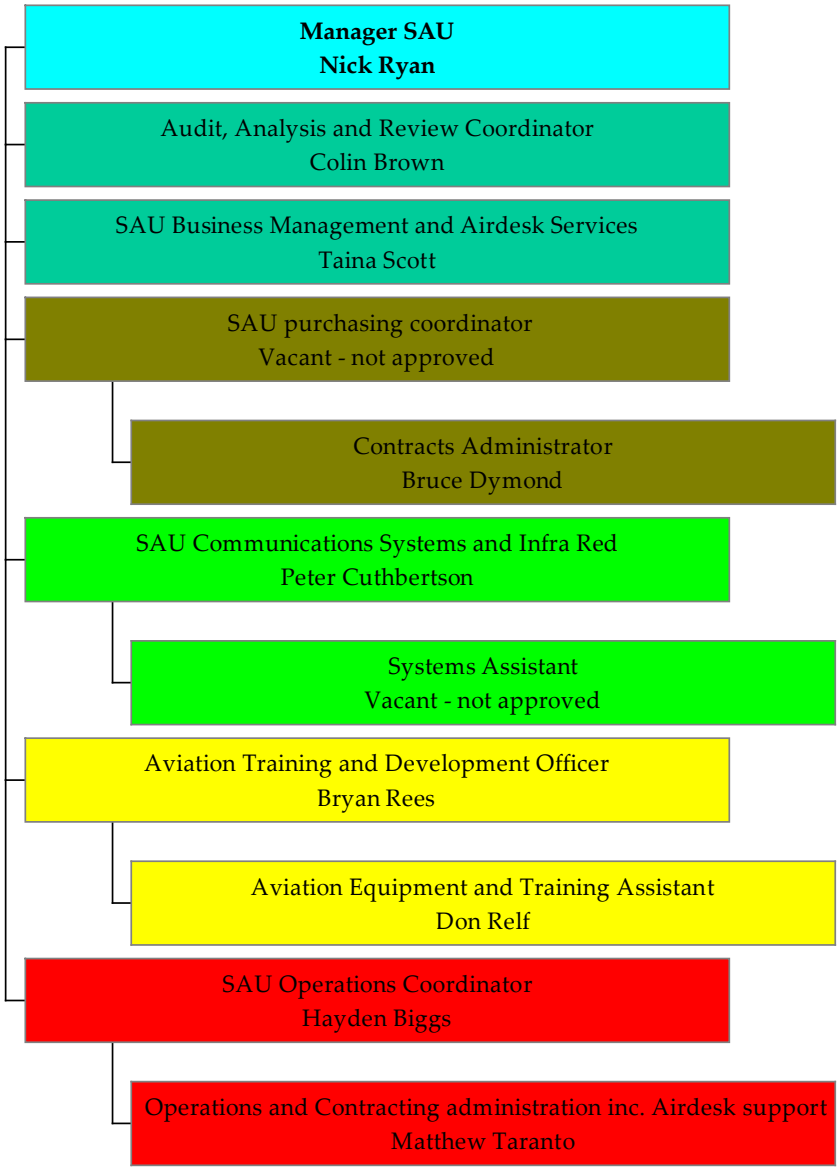
In addition, the SAU liaises with, and provides support where appropriate to numerous organisations such as the Victorian Rural Air Ambulance, Victoria Police, search and rescue organisations, catchment management authorities, aviation industry governing bodies and national and international fire and land management organisations.

Functional Structure

The SAU reports to the CFA Chief Officer and DSE Director Emergency Management. The SAU is responsible for the operation of the State Airdesk, the aircraft fleet coordination and dispatch function of the unit.



The structure of the SAU was reviewed and the following organisational arrangements implemented in December 2004.



Aircraft Resources

Aircraft have been used in Victoria by land management agencies since 1925 and are now an integral part of fire suppression and land management capability. Formal contract arrangements for firebombing aircraft have been continuously in place since 1967.

Over the past 79 years aircraft use in Victoria has grown as the availability and performance of aircraft has improved, technology has advanced, the understanding and management of fire, land and the environment has matured and the funding of fire and land management programs has increased.

During each fire season, the State Aircraft Unit, on behalf of the CFA and DSE, manages a fleet of between 20 and 30 specialised aircraft (under exclusive-use contracts) to assist fire suppression operations. The number of aircraft engaged is dependent on climatic and weather conditions, the incidence, scale and severity of fires and the number and extent of land management activities requiring aircraft support. In an average year, more than 600 wildfires occur in Victoria's parks and forests and burn about 110 000 hectares. Fixed-wing and rotary-wing firebombing aircraft are used to drop suppressants and retardant on the fires.

A register of Call When Needed (CWN) and regional aircraft is also maintained, to supplement the contracted aircraft if required.

For the 2004/05 fire season a total of 28 aircraft were contracted for specialist fire operations. The fleet consisted of 12 fixed wing aircraft and 16 helicopters. Four of the helicopters were designated as "National Fleet" aircraft and as such attracted approximately half of their capital lease cost from the Commonwealth. Another helicopter, a Type 2 helicopter was engaged by DSE on behalf of Melbourne Water who provided the funding for the aircraft. The Erickson Air Crane a Type 1 helicopter was incorporated as one of the National Fleet aircraft.

State and National Fleet Aircraft composition

Categorisation of rotary wing aircraft used for firebombing operations.

Rotary Wing aircraft used for fire bombing are assigned a Type based on internal payload and water carrying capacity, as specified in Table 1.

Table 1: Categories of Rotary Wing Firebombing Aircraft (see details below)

Type	**Internal payload**	**Water carrying capacity**
1	**2,268 kg** or greater	**2,650 litres** or greater
2	Between **1,134 kg** and **2,267 kg** inclusive	Between **1,135 litres** and **2,649 litres** inclusive
3	Between **544 kg** and **1,133 kg** inclusive	Between **380 litres** and **1,134 litres** inclusive
4	Less than **544 kg**	Less than **380 litres**

Source: National Aerial Firefighting Centre PR001

Categorisation of fixed wing aircraft used for firebombing operations.

Fixed Wing aircraft used for fire bombing are assigned a Type based on firebombing capacity and design features, as specified in Table 2.

Table 2: Categories of Fixed Wing Firebombing Aircraft (see details below)

Type	**Design features**	**Water carrying capacity**
1	Not A SEAT	Greater than **11,356 litres**
2	Not a SEAT	Not a SEAT Between **11,356 litres** and **6,813 litres** inclusive
3	Not a SEAT	Not a SEAT Less than **6,813 litres**
4	SEAT	SEAT Greater than **2,270 litres**
5	SEAT	SEAT Less than or equal to **2,270 litres**

Source National Aerial Firefighting Centre PR002

Type 1 Helicopters

The Type 1 helicopters have been dedicated high volume fire bombing helicopters. More recent additions to the State Fleet, with the support of NAFC, they have had the ability to carry increased passenger numbers and/or carry heavier underslung cargo loads as well. The helicopters can be fitted with special "underbelly" firebombing tanks or an underslung flexible firebombing bucket. The helicopters have the ability to fill themselves from a wide range of water sources in less than 40 seconds and can dump up to 9000 litres of water or foam on a fire edge.

Type 2 Helicopters

The Type 2 helicopters are primarily used for firebombing, crew transport and for the rappelling of specially trained fire fighters into remote areas. All of the helicopters are fitted with special "underbelly" firebombing tanks which are able to fill themselves from a wide range of water sources in approximately 55 seconds and have the ability to dump 1200-1400 litres of suppressants or retardant on a fire edge.

Type 3 Helicopters

The Type 3 helicopters are versatile and perform a wide range of fire related roles. Fire detection, reconnaissance and command are the primary uses. These specially equipped and modified aircraft may also be involved in Air Attack Supervision of fire bombers, carrying Forward Looking Infra Red (FLIR) camera, transporting fire crews or equipment and stores, or in lighting backburns with incendiary dropping equipment. In certain circumstances the light helicopters may also be used for firebombing using an underslung firebombing bucket.

Single Engine Air Tankers (SEATS)

A SEAT is a single engine aeroplane (Single-Engine Air Tanker) adapted from, or with the design characteristics of, an agricultural aircraft. The SEATS are robust and their flight characteristics and power enables them to work from short, rough airstrips whilst still delivering good loads of fire retardant mixtures. The SEATS are able to deliver the retardant to the fire at a lower cost per litre than other aircraft.

Specialist Aircraft

The other important tactical aircraft are a Cessna 404 which carries DSE's airborne infra red line scanner for fire detection and mapping, and a Cessna 337 which is a multi purpose aircraft for reconnaissance and information gathering, air attack coordination and passenger transport.

Table 3 below details the aircraft managed by the SAU on behalf of the CFA and DSE.

Table 3: State Fleet and National Fleet Aircraft for the 2004/05 fire season.

Aircraft Callsign	Type	Nominated Base	Firebombing system (Full capacity)
Type 1 (Heavy Helicopters)			
Helitack 141 *	S64F	Essendon	9000 litre Belly Tank
Helitack 147 *	Bell 214B	Essendon	2700 litre Belly Tank
Helitack 148 *	Mil Mi8	Mansfield	4600 litre Bucket
Type 2 & 3 (Medium Firebombing Helicopters)			
Helitack 331	Bell 412	Moorabbin	1400 litre Belly Tank
Helitack 332	Bell 212	Benalla	1400 litre Belly Tank
Helitack 333	Bell 212	Heyfield	1400 litre Belly Tank
Helitack 334	BK117B2	Bacchus Marsh	1200 litre Belly Tank
Helitack 335	Bell 205	Colac/Essendon	1400 litre Belly Tank
Helitack 345	Bell 212	Olinda	1400 litre Belly Tank
Type 3 (Light Helicopters)			
Firebird 301	Bell 206B3	Horsham	410 litre Bucket
Firebird 302	AS350B2	Moorabbin	500 litre Bucket
Firebird 303	Bell 206B3	Ovens (Myrtleford)	410 litre Bucket
Firebird 304	Bell 206B3	Bairnsdale	410 litre Bucket
Firebird 305	Bell 206B3	Bendigo	410 litre Bucket
Firebird 306	Bell 206L	Moorabbin	500 litre Bucket
Firebird 107 *	AS350	Essendon	500 litre Bucket
SEATS (Fixed Wing Bombers)			
Bomber 351	AT802	Stawell	1950 litre Hopper
Bomber 352	Dromader	Portland	2500 litre Hopper
Bomber 353	Dromader	Hamilton	2500 litre Hopper
Bomber 354	AT802	Albury	3200 litre Hopper
Bomber 355	Dromader	Bairnsdale	2500 litre Hopper
Bomber 357	Dromader	Deniliquin	2500 litre Hopper
Bomber 358	Dromader	Leongatha	2500 litre Hopper
Bomber 359	Dromader	Benambra	2500 litre Hopper
Bomber 360	Turbo Thrush	Horsham	1950 litre Hopper
Bomber 365	Turbine Dromader	Bendigo	3000 litre Hopper
Specialist aircraft			
Firescan 350	C404	Essendon	-NA-
Birddog 366	C337	Essendon	-NA-

* Resource is supplied through the National Aerial Firefighting Centre

Call When Needed and Regional Aircraft

The SAU coordinates a register of Call When Needed (CWN) and Regional aircraft that are available for DSE and CFA operations. CWN aircraft and operators may be utilised in the following circumstances:

- when State Fleet aircraft are not available or are inefficient to be used,
- when State Fleet aircraft do not meet the required specification (eg. Large passenger transport) and
- when demand for State Fleet aircraft is predicted to exceed supply due to potential for a large number of incidents (preparedness).

Regional aircraft are those aircraft engaged by DSE or CFA regions for various roles including personnel transport, reconnaissance and air attack supervision. Extensive use is made of these light fixed wing aircraft, such as the Cessna 182 or Cessna 337, providing a cost-effective means of fire detection and complementing DSE's and CFA's network of fire spotting towers. These types of aircraft are also used for reconnaissance and command and providing guidance to the firebombing aircraft.

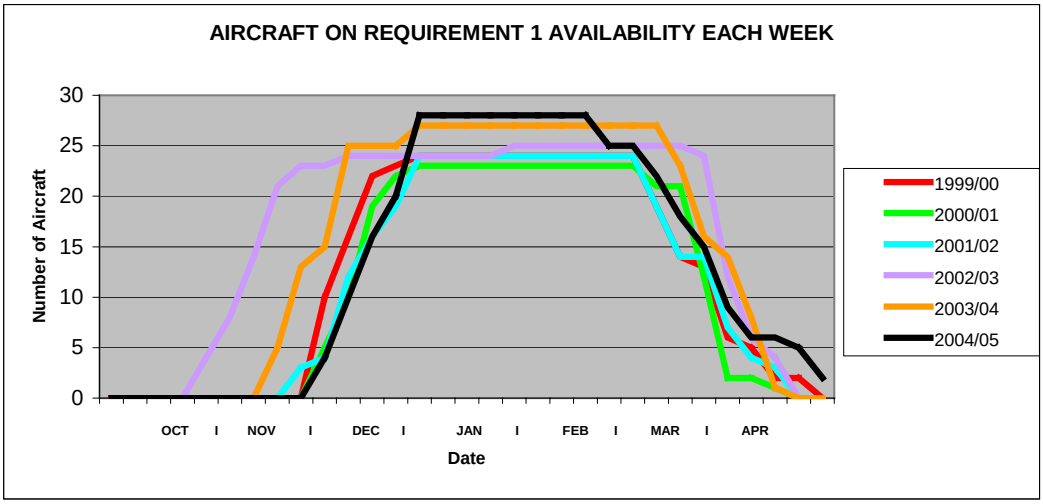
Aircraft Usage

The first SAU managed aircraft to commence availability began on December 1st 2004 and the last finished availability on May 24th 2005, as shown in Table 4. The 2004/05 fire season was of lower activity in comparison with the 2003/04 season, with comparisons to the previous 5 seasons displayed in Graph 1.

Table 4: Start and finish dates for 2004/05 aircraft availability periods (Requirement 1 and 2)

Aircraft Callsign	Start Date	Finish Date
Type 1 (Heavy Helicopters)		
Helitack 141 *	15 Dec 2004	22 Feb 2005
Helitack 147 *	29 Dec 2004	22 Mar 2005
Helitack 148 *	29 Dec 2004	22 Mar 2005
Type 2 & 3 (Medium Firebombing Helicopters)		
Helitack 331	8 Dec 2004	22 Feb 2005
Helitack 332	22 Dec 2004	29 Mar 2005
Helitack 333	15 Dec 2004	26 Mar 2005
Helitack 334	1 Dec 2004	3 May 2005
Helitack 335	22 Dec 2004	3 May 2005
Helitack 345	22 Dec 2004	29 Mar 2005
Type 3 (Light Helicopters)		
Firebird 301	8 Dec 2004	24 May 2005
Firebird 302	1 Dec 2004	10 May 2005
Firebird 303	22 Dec 2004	26 Apr 2005
Firebird 304	29 Dec 2004	3 May 2005
Firebird 305	1 Dec 2004	5 Apr 2005
Firebird 306	8 Dec 2004	26 Apr 2005
Firebird 107 *	15 Dec 2004	22 Feb 2005
SEATS (Fixed Wing Bombers)		
Bomber 351	1 Dec 2004	8 Mar 2005
Bomber 352	29 Dec 2004	29 Mar 2005

Bomber 353	29 Dec 2004	22 Mar 2005
Bomber 354	22 Dec 2004	15 Mar 2005
Bomber 355	15 Dec 2004	8 Mar 2005
Bomber 357	1 Dec 2004 30 Mar 2005	15 Mar 2005 3 May 2005
Bomber 358	29 Dec 2004	26 Apr 2005
Bomber 359	15 Dec 2004	3 May 2005
Bomber 360	1 Dec 2004	29 Mar 2005
Bomber 365	8 Dec 2004	19 Apr 2005
Specialist aircraft		
Firescan 350	8 Dec 2004	29 Mar 2005
Birddog 366	8 Dec 2004	16 Mar 2005



Graph 1: Aircraft on Requirement 1 Availability 1999/00 to 2004/05.

Total usage in 2004/05 for the State Fleet and National Fleet aircraft is detailed in Table 5, with comparisons to the previous two years figures. Subsequent tables indicate usage by aircraft category and individual aircraft. Graph 2 displays CFA and DSE usage from 1996/97 to 2004/05.

The State Airdesk recorded 704 dispatches to 30 June 2005 inclusive. This included fire and other emergency incidents, prescribed burning operations and other land management activities. Notification by CFA and DSE Regions of deployments of light fixed wing reconnaissance and observation aircraft were also recorded and entered into the State Airdesk dispatch system.

The following organisations were users of State Fleet and National Fleet aircraft:

- Country Fire Authority
- Department of Sustainability and Environment
- Department of Primary Industries
- Parks Victoria
- VicForests
- Rural Fire Service, NSW
- Country Fire Service, SA

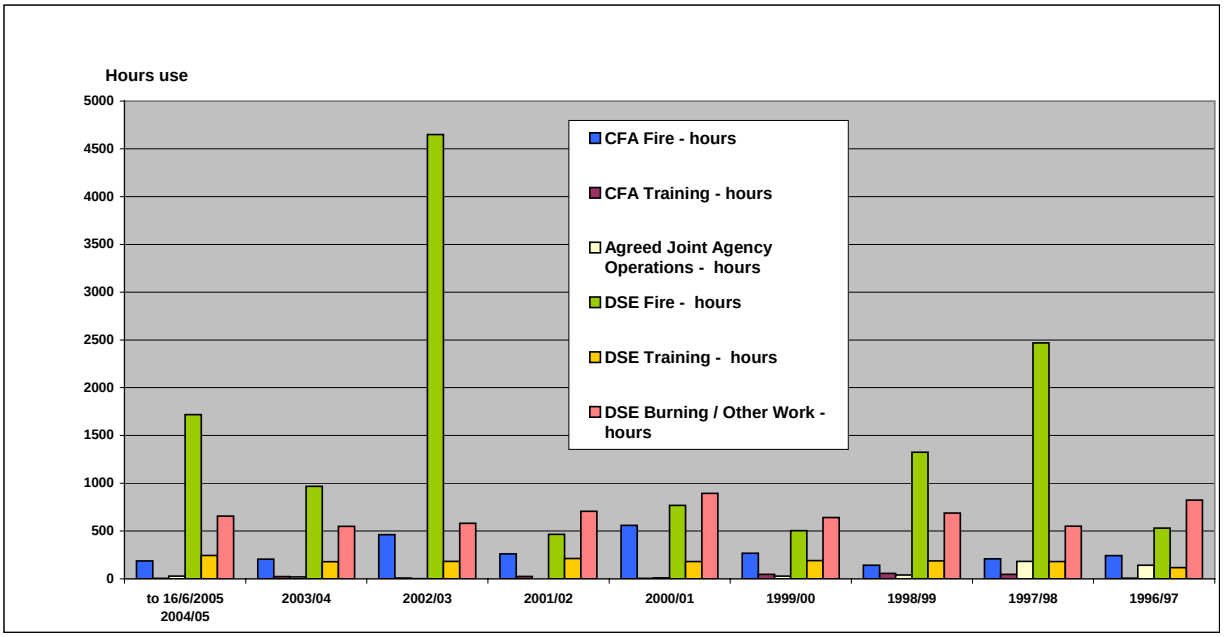
Other organisations that have access to State Fleet aircraft upon request are:

- Ambulance Victoria
- Metropolitan Fire and Emergency Services Board
- Victoria Police
- State Emergency Service

These organisations did not request aircraft in the 2004/05 fire season.

Table 5. Usage (hours) of State Fleet, National Fleet and some tactical Call When Needed aircraft for the last three years

Agency / Operation	**2004/05 to 16/6/05**	**2003/04**	**2002/03**
CFA – fire	187.4	207	462
CFA – training	4.65	23.2	8.75
Agreed joint agency operations	27	18.7	1.17
DSE – fire	1716.74	967.50	4648
DSE - training	244.86	178.65	182
DSE – burning / other works	656.25	550	581.9
VicForests – burning & seeding	167.61		
Victoria Total hours	**3021.29**	**1945.05**	**5883.82**
CFA Total hours	**205.55**	**239.55**	**471.34**
DSE Total hours	**2631.35**	**1705.50**	**5412.49**



Graph 2: State Fleet and National Fleet aircraft total hours flown by CFA and DSE 1996/97 to 2004/05.

The Victorian average total usage over the past 9 years is approximately 2,728.97 hours per financial year.

The incidents with the highest aircraft usage were:

Incident Name.	Total hours flown.
• DSE Tidal River, Wilsons Prom.	505
• DSE Fulham, Horsham	221.4
• DSE Bald Hill, Heyfield	127
• DSE Sentinels, Heyfield	90.7
• DSE Bomjinna, Horsham	79
• DSE The Rock, Alexandra	70.3
• CFA Skipton/Carrambalac R6/15	34.5
• CFA Cranbourne Gardens R8	28

Table 6. Type 1 Helicopter usage

Aircraft	**Location**	**Hours**	**Hours by task** (ferry time not included)
			Firebombing
Helitack 141	Essendon	20.96	
Helitack 147	Essendon	31.32	
Helitack 148	Mansfield	80.59	
Total		**132.87**	**110.01**

Three Type 1 helicopters were engaged for the 2004 / 05 fire season and are were on absolute availability (15-minute response). The resources engaged were

i. an S64F Air-crane ***(Helitack 141)*** with the ability to deliver large volumes of fire retardant with versatility, high performance, manoeuvrability and the capability of quick turn-arounds.

ii. a Bell B214B ***(Helitack 147)*** to provide additional high volume fire bombing in the urban interface area and

iii. a Mil Mi 8 MTV ***(Helitack 148)*** to utilise a high volume underslung bucket in remote locations.

The Type 1 fire bombing helicopters flew a total of **132.87 hours** in fire suppression operations during the fire season; they picked up a total of **835 loads** and delivered a total of **3, 491, 111 litres** of water and water injected with foam concentrate. Total days of unavailability for Type 1 helicopters was 2.5 days.

Helitack 141 demonstrated the ability to quickly deliver large volumes of fire suppressant in potentially threatening situations under extreme fire danger conditions. Using direct attack on high intensity fires the Air-crane was credited with several significant saves where high value assets were protected in threatening situations. The operation of ***Helitack 147*** was limited by the ability of the aircraft to maintain serviceability due to mechanical failure. The operation of ***Helitack 148*** indicated that the helicopter and under slung bucket combination worked well. The versatility of ***Helitack 148*** was impeded by the ***Restricted Category*** certification preventing the transport passengers/crew for fire operations.

Table 7. Type 2 and 3 Firebombing Helicopter usage

Aircraft	**Location**	**Hours**	**Hours by task** (ferry time not included)			
			Firebombing	Rappelling	Firefighter transport	Training
Helitack 331	Moorabbin	35.07				
Helitack 332	Benalla	64.21				
Helitack 333	Heyfield	308.74				
Helitack 334	Bacchus Marsh	94.20				
Helitack 335	Colac/Essendon	144.93				
Helitack 345	Olinda	22.33				
Total		**669.78**	**241.39**	**114.66**	**201.47**	**2.85**
CFA Total		**70.38**				
DSE Total		**599.40**				

The Type 2 and 3 firebombing helicopters flew a total of **669.78 hours** in operations during the 2004/05. Total days of unavailability for Type 2 and 3 firebombing helicopters was 1 day.

Six Type 2 and 3 firebombing helicopters, all fitted with fire bombing belly tanks, were engaged for the 2004/05 fire season at various locations across the State, and were on a 15 minute, absolute availability response requirement. The Type 2 helicopters comprised of three primary rappel capable, passenger transport and fire bombing aircraft, being two B212s ***Helitack 332 & Helitack 333*** and one B412 ***Helitack 331.*** The other three, a B212 ***Helitack 345,*** a BK 117 ***Helitack 334*** and a B205 ***Helitack 335*** (secondary rappel capable aircraft) operated as fire bombing and passenger transport aircraft. Five of the helicopters were engaged and funded by DSE & CFA, with an additional helicopter ***Helitack 345*** was engaged by DSE on behalf of and funded by Melbourne Water and was positioned at Olinda.

One Type 2 helicopter ***Helitack 335*** was repositioned from Essendon to Colac due to the availability of a NAFC resource based at Essendon. ***Helitack 333*** was utilised prior to the commencement of the fire season for the DSE rappel crew training period at Point Cook and Mt. Buller. All of the Type 2 helicopters were activated for firebombing in various locations across the State. The rappel capable aircraft were dispatched and operated with the DSE rappel crews on several remote wildfires. Several helicopters were deployed to Wilson's Promontory during the Pumphouse Fire for a considerable period of time, for one of the most significant firefighter transport operations in recent years, as well as the primary task of firebombing.

Helitack 345, a Bell 212 Type 2 firebombing helicopter, based at Olinda.

One deployment saw ***Helitack 332*** working in conjunction with ***Bomber 354, Firebird 303*** and Rural Fire Service air and ground resources on wildfire operations in New South Wales. Towards the end of the fire season ***Helitack 333, Helitack 334*** and ***Helitack 335*** were utilised on several occasions for executive passenger transport for investigation and recovery teams reviewing the 2003 Alpine fires recovery program. All of the helicopters participated in combined agency air operations recurrency days. ***Helitack 334*** was repositioned to the Avalon Airshow in March on standby for fire duty at CFA request

Table 8. Type 3 Helicopter usage (including Requirement 2 period)

Aircraft	**Location**	**Hours**	**Hours by task** (ferry time not included)				
			Air Attack	Aerial Ignition	FLIR	Reconnaissance/ Detection	Training
Firebird 301	Horsham	144.93					
Firebird 302	Moorabbin	465.02					
Firebird 303	Ovens (Myrtleford)	161.78					
Firebird 304	Bairnsdale	186.69					
Firebird 305	Bendigo	345.04					
Firebird 306	Moorabbin	78.16					
Firebird 107	Essendon	119.08					
Total		**1517.28**	**236.84**	**321.20**	**113.71**	**294.59**	**27.99**
CFA Total		**76.25**					
DSE Total		**1441.03**					

The contracted Type 3 helicopters flew a total of **1517.28 hours** in fire suppression and land management operations during the year. Total days of unavailability for Type 3 helicopters was 6 days.

Seven Type 3 helicopters were engaged for the 2004/05 fire season. Five of the helicopters are absolute availability, 15 minute response requirement aircraft, one helicopter ***Firebird 306*** is on a partial availability, 120 minute response requirement, which has the ability to be elevated to 15 minutes. DSE and CFA funded all the helicopters. The seventh helicopter ***Firebird 107***, was on absolute availability and was jointly funded by Victoria and NAFC. The primary role of ***Firebird 107*** was to provide a dedicated air attack coordination platform for the Type 1 helicopter ***Helitack 141***. The fleet of Type 3 helicopters were dispatched to many CFA and DSE wildfire incidents across the State, where they undertook various roles such as providing platforms for air attack coordination, reconnaissance gathering operations and assisting with fire fighter and passenger transport. The versatility and availability of the helicopters allowed them to be utilised for many land management activities for DSE, DPI, Parks Victoria and VicForests prior to, during and at the conclusion of the fire season.

Several helicopters operated extensively in their primary roles during the fire season. ***Firebird 301*** based in the west of the State, provided rapid response for the specially trained DSE hover exit fire crews at numerous wildfires in remote areas. ***Firebird 302*** positioned in Melbourne was heavily utilised as the Forward Looking Infra Red (FLIR) platform in both CFA and DSE operations across the State. On many occasions the Type 3 helicopters were utilised to assist with information gathering for the Plague Locust Task Force managed by DPI. Towards the end of the fire season high intensity regeneration burning, aerial seeding and hazard reduction burning were a significant component of the Type 3 helicopters usage.

Table 8. SEATS usage

Aircraft	**Location**	**Hours**	**Hours by task** (ferry time not included)	
			Firebombing	Training
Bomber 351	Stawell	55.48		
Bomber 352	Portland	17.30		
Bomber 353	Hamilton	32.51		
Bomber 354	Albury	33.91		
Bomber 355	Bairnsdale	21.73		
Bomber 357	Deniliquin	71.67		
Bomber 358	Leongatha	42.83		
Bomber 359	Benambra	77.20		
Bomber 360	Horsham	44.83		
Bomber 365	Bendigo	61.48		
Total		**458.94**	**284.43**	**30.38**
CFA Total		**13.41**		
DSE Total		**445.53**		

This season saw the first year of the new contract cycle for fixed wing bombers. Ten SEATS were engaged for the 2004/05 fire season. Six of the SEATS are absolute availability, 15 minute response requirement aircraft; the remaining four aircraft are on a partial availability, 120 minute response requirement which have the ability to be elevated to 15 minute response. The fleet has a mixture of turbine and piston engine aircraft.

The Turbine Dromader (Bomber 365) based at Bendigo

Changes to the SEAT fleet composition included the introduction for the first time to Victoria of a Turbine Dromader (***Bomber 365***) based at Bendigo and the engagement of an Air Tractor AT802F (***Bomber 351***), positioned at Stawell. The current combination and composition of aircraft has resulted in a cost effective, higher delivery volume for the fleet compared to

previous years. The majority of the operating time for the SEATS was on DSE wildfire incidents where the aircraft were delivering either retardant or water mixed with foam concentrate from the network of DSE fire bombing bases. A high proportion of the fleet participated in combined agency air operations recurrency days.

Under DSE and CFA cross border agreements, two of the SEATS were repositioned or deployed interstate to assist with preparedness and suppression operations. On two occasions ***Bomber 352*** was repositioned into South Australia to assist with higher levels of preparedness. On two occasions ***Bomber 354*** was deployed to assist Rural Fire Service with firebombing operations in NSW. During one deployment ***Bomber 354*** worked with ***Helitack 332*** and ***Firebird 303*** in NSW. ***Bomber 354, Bomber 357, Bomber 359*** and ***Bomber 365*** were utilised prior to the commencement of the fire season for two SAU Air Attack Supervisor and Aircraft Officer training courses at Mangalore.

The contracted SEATS flew a total of **445.53 hours** in fire preparedness and suppression operations during the fire season. Total days of unavailability for SEATS was 4 days.

Table 6. Specialist aircraft usage

Aircraft	**Location**	**Hours**	**Hours by task** (ferry time not included)			
			Infra red	Air Attack	Reconnaissance	Training
Firescan 350	Essendon	**33.86**	**32.49**			
CFA Total		**1.22**				
DSE Total		**32.64***				
Birddog 366	Essendon	**54.80**		**5.69**	**6.96**	**14.30**
CFA Total		**-**				
DSE Total		**54.80**				

*DSE hours include ferry time of several flights to Adelaide associated with the development of the new linescanner equipment.

The Infra red Linescan aircraft was deployed to only two incidents this season, both in the west of the State. This is well below the average use for the past 3 years.

Birddog 366 the contracted Cessna 337, a high wing, twin engine reconnaissance and air attack supervision platform, was utilised several times during the year to assist with regional and State preparedness requirements. ***Birddog 366*** is contracted on a partial availability, 120 minute response requirement, which has the ability to be elevated to 15 minute response. The aircraft provided valuable support to State preparedness in the west of the State when a Type 3 helicopter became unavailable. The aircraft was utilised for reconnaissance and air attack coordination during this period.

During the fire season it was repositioned to Mansfield to support regional preparedness and assist with the effectiveness of the Type 1 helicopter resource located at Mansfield. On several occasions the aircraft was utilised for the transport of firefighters and important equipment across the State.

Several aircraft were engaged from the SAU Call When Needed (CWN) Register to assist with fire and land management resourcing during 2004/05. CWN aircraft were also engaged as part of preparedness arrangements and participated in training courses and recurrency days. Additional Type 3 helicopters were engaged to assist with the large scale high intensity regeneration burning, aerial seeding and the prescribed burning program. On one occasion

when all higher volume firebombing aircraft located in the State were deployed on fire operations, supplementary Type 3 bucket equipped helicopters were engaged. An additional CWN Type 1 helicopter was engaged to assist during this time as well.

During March 2005, with the high number of wildfires developing in the far south west of the State, South Australia (SA) provided assistance in the form of one small capacity SEAT to assist with fire bombing operations. The SA SEAT was registered on the Victorian CWN Register. The total use of CWN aircraft was minimal.

The SAU also organised various passenger transport flights throughout the year using approved operators from across Victoria.

Rappel and Hover Exit Program

The SAU maintained the high level of training and preparedness required by this program again this year, training specialist DSE firefighters to make up 4 rappel crews (28 personnel) and 2 hover exit crews (13 personnel).
The rappel exchange program between DSE and the Ministry of Forests in British Columbia, Canada, now in its 13th year, continued with Anthony Knobel from the Ovens rappel crew spending summer in Canada, whilst Silas Wiefelspuett was employed with the Heyfield rappel crew during 2004/05.
Extensive use of rappel crews was made during the Sentinels, Sugarloaf and Tidal River DSE incidents.

Rappel crew training at Mt Buller

Air Attack Supervisor (AAS) Reports

Collection of mandatory AAS reports continued for the second year. Pre-season briefings to aviation personnel stressed the importance of this information collection.

Data collected over the past 2 years display the following trends:

- The average time taken by an AAS and platform from activation to departure on an extreme FDI day is 17 minutes. For days of lesser FDI, the average is 42 minutes.
- The average time on task for an AAS deployment to a CFA fire is 6 minutes. The average time on task for an AAS deployment to a DSE fire is 56 minutes.
- 51% (57 operations) of air attack operations were considered by the AAS to be very effective. 26% (29) were rated quite effective and 13% (14) rated effective. 10% (11) were given an effectiveness rating of partially or not effective.
- 57% of aircraft deployments to an incident where CFA was the lead agency occurred with an IMT operating. For incidents where DSE was the lead agency this was 82%.
- 12% of AAS activations occur between 1530 and 1630 hours.
- 72% of air attack operations involved only direct attack.

It should be noted that these trends have only reflected 2 years of aerial operations. With more information gathered in the coming years, the SAU will gain a greater understanding of operational and safety issues, to be used in strategic decision making and aviation training courses.

National Aerial Firefighting Strategy (NAFS)

Following the serious bushfires that affected Australia over recent years the use of aircraft for aerial firefighting has grown in Australia. The Commonwealth, States and Territory Governments decided to develop a joint approach to manage aerial firefighting to improve operational performance and cost effectiveness nationally. As a result, the Commonwealth Department of Transport and Regional Services (DOTARS) and the Australasian Fire Authorities Council (AFAC) produced a draft National Aerial Firefighting Strategy. This strategy envisaged a national cooperative arrangement to enhance aerial firefighting resources and resource sharing across Australia. The Commonwealth Government has subsequently provided funding to assist State and Territory Governments with aerial firefighting. This funding has supported a shift in focus to larger capacity aircraft and an impetus towards national arrangements. The national arrangements were formalised after the Commonwealth agreed to provide $5.5 million dollars per year in 2003/04 and in 2004/05 to assist States and Territories in aerial firefighting. Under the arrangement the Commonwealth provides half of the lease costs of the aircraft and the State or Territory meets the remaining lease and operating costs. The national arrangements allow resources to be redeployed to areas experiencing high fire risk and are an example of Australia's firefighting and land management agencies working cooperatively to provide greater community fire protection

National Aerial Firefighting Centre

The National Aerial Firefighting Centre (NAFC) co-ordinates and manages the acquisition of firefighting aircraft for the Commonwealth and the States and Territories of Australia. National Fleet aircraft services are designed to complement the services that are already in place in various States and Territories and the services that Members will source through their own procurement arrangements. NAFC was incorporated in July 2003 and represents New South Wales, Victoria, Tasmania, South Australia, Western Australia, Queensland and Australian Capital Territory.

Victoria continued to participate in the national strategy this season with the supply of one Mil Mi8 at Mansfield, one Bell 214B at Essendon, one S64F Aircrane at Essendon with an Aerospatial AS350BA Squirrel as accompanying AAS platform.

The level of funding from the Commonwealth for 2004/05 was approximately $2.013m. The National Aerial Firefighting Centre Board's decision to redistribute funding to members has given Victoria a projected allocation for 2005/06 of approximately $1.88m.

Current procurement cycle for Aircraft Services

The SAU developed a Strategic Procurement Plan for the on-going procurement of aviation services for a 5-year period commencing in 2004/05. The Victorian Government Purchasing Board approved this plan in November 2004. The SAU are currently implementing this plan on behalf of CFA and DSE.

SEATS (Fixed Wing Bombers)

The SAU sought tenders for SEATS services in June 2004 . Evaluation of the tenders resulted in 10 fixed wing bombing services being procured in October 2004. The recommended services maintained the same number of SEATS aircraft located in Victoria whilst increasing the firebombing capacity and performance capability of the fire bombing fleet, providing improved value for money. Each of these services was engaged in 2004/05.

Infra red Linescanning aircraft

The SAU commenced a Request for Proposals for infra red linescanning services in April 2004, and following the evaluation panel assessing these proposals, Request for Tenders - Best and Final Offers were invited in July 2004. A new linescanning aircraft service was chosen in October 2004. This aircraft, a Beechcraft KingAir, provided improved speed and endurance, allowing a greater area of the state to be covered in a shorter time. Being turbine powered, this also allows to aircraft to fly to greater heights, which is an advantage when scanning large fires.

Type 2 and Type 3 Helicopters (Light Helicopters and Medium Helicopters)

Request for Proposals for these services were publicly advertised in December 2004, with Request for Tenders - Best and Final Offers invited from a shortlist of organisations and received in May 2005. The Tender Panel is currently evaluating the offers and intends to complete the process by October 2005.

National Aerial Firefighting Strategy 2003 - 2005

For the 2003-2005 fire seasons the NAFC, on behalf of Member State and Territory Governments, contracted 13 aircraft for specialist aerial fire fighting operations. The 2003–2005 Strategy has now been completed. All aircraft were designated as "National Fleet" aircraft and as such attracted approximately half of their capital lease cost from the Commonwealth. The Victorian Erickson Air Crane S64F, a base fleet resource was included as one of the "National Fleet" aircraft. The following aircraft were engaged under the Strategy.

Helitack 141 - Erickson S64F Air Crane – 9,500lt. Fixed tank.

Helitack 147 - Bell 214B – 2,700lt. Fixed tank.

Helitack 148 - MI 8 – 4,600lt. Bambi bucket.

Firebird 107 - Bell 206L (2003/04) / AS 350 BA (2004/05)

National Aerial Firefighting Strategy 2005 - 2010

NAFC has commenced a new process of contracting resources for national aerial firefighting that will take effect from the 2005/06 fire season. These new contracts will be longer-term contracts of at least two years duration with a 1 + 1 + 1 year option.
NAFC invited parties interested in submitting a Request for Proposal (RFP) for these new contracts to register their interest with NAFC. The RFP closed in August 2004. The RFP evaluation process has now concluded, resulting in a number of proposals considered to be adequate enough to provide a range of solutions for the various Member States and Territories.

Aircraft Contractor Audits

The SAU developed and implemented an Audit Plan during 2004/05. This ongoing plan is designed to ensure aircraft companies contracted or engaged by Victoria for firefighting operations, comply with Federal and State Government Acts and Regulations, and with agency Policy and Regulations. In 2004/05, the following performance targets were met:

- Each of the 24 State Fleet aircraft and 4 National Fleet aircraft underwent a compliance audit to verify that they met all contractual requirements.
- Company audits were conducted with the 2 new State Fleet contractors for this financial year. These audits focus on the capacity and viability of the organisation to supply the contracted service/s.

This Audit Plan is an annual program with aircraft compliance audits being conducted each year, aircraft company audits carried out as required and compliance audits of Call When Needed and light fixed wing aircraft conducted at random during the fire season.

Operator Debrief Program

Formal debriefs were conducted with all of the contracted companies including NAFC resources, at the conclusion of the availability period for each of the aircraft for the 2004/05 fire season. The purpose for the debrief process was to provide an opportunity for each of the contractors to have "their say" in a forum to address any issues that may have develop in a professional manner. The debriefing process has been incorporated as part of the SAU audit program, which ensures that the SAU and contractor continue to conduct operations safely and effectively. All of the debriefs were conducted in Melbourne this year. Future debriefs will be conducted in provincial areas to minimise the impact on a contractor's commercial commitments.

Accidents / Incidents Reporting

The SAU have in place mandatory reporting requirements, should aircraft and Agency personnel be involved in an accident or incident. Any aviation occurrence shall be reported to the State Airdesk as soon as possible, with the State Aircraft Coordinator responsible for determining the immediate action to be taken. The State Aircraft Coordinator will make a recommendation to either the CFA or DSE State Coordinator (dependent upon who is the lead agency at the time) and also decides whether an investigation is deemed necessary.

The following accidents / incidents were reported this year:

In-Flight Loss of Power PZL M18A Dromader
Mount Korong, Victoria Australia 2nd. January 2005

On Sunday 2nd January 2005 at approximately 1715 hours, whilst engaged in fire bombing operations during the Mount Korong Fire (DSE Bendigo Fire District, Fire No.54) Firebomber 365 (BOM 365) a turbine powered PZL M18A Dromader suffered an engine failure. The pilot of a BOM 365 was circling a sector of the wildfire in preparation for the delivery of aerial suppressant. The pilot reported that he had suffered an engine failure, the engine could not be started again after numerous attempts. Subsequently a forced landing ensured where the aircraft descended and landed on the ground. The aircraft did not crash and the pilot did not sustain any injuries. The aircraft sustained minor damage to the undercarriage after striking a private property-dividing fence.

Damage to rotor-blade AS350B2 Squirrel
DSE Noojee workcentre, Victoria Australia 1st. April 2005

On Friday 1st April 2005 at approximately 0815 hours, prior to commencing prescribed burning operations in the Noojee area, Firebird 302 an Aerospatial AS350 B2 Squirrel, suffered main rotor damage when a forklift collided with the stationary aircraft. The DSE works coordinator directed a Project Fire Fighter to move 3 drums of fuel to the aircraft using a forklift. The Incendiary Operations Supervisor was involved in discussions away from the aircraft, whilst the pilot was carrying out a pre-flight check on the right hand side of the machine. The forklift operator approached the aircraft from the left hand side and as the drums were being lowered, the forklift mast collided with the leading rotor blade. A joint inspection of the blade was conducted and the aircraft deemed unserviceable. No person sustained injuries.

Leaking fuel container

On Wednesday 13 April 2005 a brand new fuel container leaked inside an aircraft causing approximately 1 litre of bar oil to spread across cargo floor area.

Failure of cargo door to close

On Wednesday 6 April 2005 the rear cargo door could not be closed on Type 2 helicopter after completion of crew transport operations. It was noticed that a broken bracket was preventing closure and security of the door. The result was that dispatcher was required to hold the door in place until return to airbase.

Breach of prohibited items on an aircraft

Fire crews coming off the fireline had disposable lighters in their possession. This means they were taken on the aircraft during their insertion earlier in the day. This was a clear breach of safety protocols and fire crews also made false statements when asked if they had such items.

Training

The SAU training program conducted various courses this year at Mangalore Airport, Point Cook Airfield, Mt Buller and the DSE North Altona depot, with a wide range of participants. Following is a list of courses managed and conducted by the SAU on behalf of CFA and DSE:

Course	Number of participants
Basic Wildfire Awareness - pilots	114
Air Attack Supervisor	23
Aircraft Officer	17
Aircraft Officer – New Zealand	18
Air Observer	16
Rappel	30
Rappel Dispatcher	6
Hover Exit	43
Hot refuelling	40
Aerial Driptorch Support Crew	14
Aerial Driptorch Operators	10
Incendiary Operations Supervisor	8
Incendiary Bombardier	22

Organisations represented at these courses were:

Country Fire Authority	Queensland Fire & Rescue Service
DSE / DPI	Forestry Tasmania
PV	ACT Emergency Services
VicForests	ACT Rural Fire Service
Country Fire Service, SA	Christchurch City Council
Commonwealth Scientific and Industrial Research Organisation	Department of Primary Industries, Water and Environment, Tasmania
Rural Fire Service, NSW	

The SAU conducted 2 pre-season pilot briefings and 6 regional pre-season briefings for CFA and DSE/DPI/PV personnel. The SAU presented updated information regarding procedures and the safe use of aircraft, whilst providing an opportunity for participants to raise any emerging issues

Air Attack Supervisor and Aircraft Officer training at Mangalore

State Fleet and regionally based light fixed wing aircraft, were also involved in the many regional recurrency days held this year at the following locations:

St Arnaud	Victoria Valley Firebombing Base
Wangaratta	Warrandyte
Dartmoor Firebombing Base	Casterton
Delatite Firebombing Base	Allans Flat
Bendigo	

These training days provided an opportunity for accredited aviation personnel to maintain currency in safe aircraft practices, airbase management, radio communication procedures and tactical response operations in a controlled manner.

Participation in airshows and displays

State Fleet aircraft were involved in various airshows and displays across the state this year. Participation in these events was subject to the approval of the Civil Aviation Safety Authority.

- Firebird 304, Helitack 333 and Bomber 355 were involved in the largest regional air display in Australia held in March at Bairnsdale. Helitack 333 conducted a rappel demonstration followed by a bombing run, whilst Bomber 355 carried out a bombing run.
- Helitack 333 attended the Heyfield Timber Festival & Field Days, giving a rappel and bombing display.
- Helitack 335 attended the Skipton Emergency Services Day as a static display, for children from schools in the district to familiarise themselves with a firefighting aircraft.

Manuals and Procedural documentation

SAU staff have developed a joint CFA/DSE Air Observer Training Manual, due for implementation in October 2005. A facilitator's handbook is being written to accompany the manual, also due to be released in October 2005.

The DSE Air Operations Manual, adopted by the CFA and DSE, is currently undergoing review, with the aim being to separate it into smaller manuals regarding Procedures and Standards, Operations and Training. The target is to have this introduced before the 2006/07 fire season.

The SAU has a wide range of publications and incident management documents available, listed in Appendix 1.

Bushfire CRC

The significant bushfires that occurred in December 2001 and January 2002 in New South Wales and the ACT provided an opportunity for the Australasian Fire Authorities Council (AFAC) to investigate the adequacy of fire research and development. There was general acceptance of a fire "industry" application for a Cooperative Research Centre (CRC). The CRC program that was established promotes a collaborative approach to research and development between industry and the public sector, which in turns supports local innovation and increases Australia's international competitiveness.

The research program of the Bushfire CRC focuses on five inter-related areas of research and related activities:

A. Safe prevention, Preparation and suppression

B. Management of fire in the Landscape

C. Community Self-Sufficiency for Fire Safety

D. Protection of People and Property

E. Education, Training and Communication

The framework for the research programs of the Bushfire CRC has been developed by end user organisations with interests in, or responsibilities for, bushfires (namely, fire and emergency services and resource management agencies, other Commonwealth and state departments and municipal authorities), in consultation with researchers and their institutions.

The SAU remains heavily involved in the Bushfire CRC Program A – Aerial and Ground Suppression Evaluation Project. Operational personnel from CFA, DSE, DPI and PV were made aware of this project and asked to provide information to the research team should the team attend an incident.

Certain information gathered from the Air Attack Supervisor reports was also supplied to the team, assisting in the study of the effectiveness of aerial suppression operations.

Equipment Development

The SAU recognised the need to establish an administrative unit to monitor and review the use and development of aviation related equipment used by both agencies. A formal group known as the Aviation Equipment Group (AEG) was established early in the year and has been very active in the development of numerous projects and items of equipment. The AEG is chaired by the DSE Manager, Fire Equipment Development Centre and comprises representatives of the SAU, CFA and regionally based DSE experienced fire operations personnel. The AEG continues to meet on a regular basis. The AEG's charter is:

> To guide development of aviation firefighting equipment by monitoring national & international trends and technologies to ensure the Aviation Equipment Group develops modern, safe, cost effective and efficient equipment.

The aims of the AEG are to

- Review current equipment (condition, performance, specifications and suitability.)
- Develop, establish and review aviation equipment standards.
- Maintain endorsement of standards.
- Promulgate standards.
- Assist and guide ongoing research and development.
- Designate equipment life limits.
- Set fees were appropriate.
- Encourage regional / field input
- Point of contact / coordination for industry.
- Assist with project budget / priority setting.
- Develop and implement aviation equipment audits.
- Identify and engage appropriate technical expertise as required.

Listed below are several projects and items of equipment that have been managed and/or developed by the AEG this year:

New Generation Aerial Incendiary Machines

The SAU and AEG conducted a continuous evaluation program on two new generation aerial incendiary machines. The evaluation investigated the operation and performance of the following machines:

Unit 1. ARLOS Pneumatic Incendiary Machine
Unit 2. Skyworks R2 Electric Incendiary Machine

The ARLOS Pneumatic unit requires compressed air to operate. The Skyworks R2 Electric unit operates using the standard electrical outlets within the helicopter. Initial field-testing was conducted at Ballarat in March 2005 with both units having been installed and operated in Firebird 305. The ARLOS Pneumatic Incendiary Machine utilises the incendiary capsules ("ping pong balls") used by the current incendiary machines. The Skyworks R2 Electric Incendiary Machine operates utilising an incendiary caplet developed and supplied by the manufacturer of the R2 machine. Field-testing has been conducted in a variety of locations and vegetation types in the North East, Gippsland and Central Victoria. Both of the units have the capacity to provide a service for DSE, Parks Victoria and VicForests. The operation of the units have be given "provisional approval" for use by DSE subject to the condition that the evaluation continues to determine the maximum value for each of the units. The Forest Service USA has reviewed the minium specifications and the evaluation program developed by the SAU and is currently monitoring the evaluation process and the out comes.

Remote Area Water Facilities

Early in 2004 and as a result of the insertion by helicopter of a plastic rainwater tank into the Mt Torbreck wildfire, the AEG conducted an investigation into the use of additional items to be used as remote area water facilities. The rainwater tank was installed by helicopter into a remote location to provide a temporary water source for ground crews. As a result of the investigation additional resources were identified. Accordingly, a training program was developed for the establishment of the facilities in remote areas and the SAU trained all DSE rappel and hover exit crews in the correct procedures for installation of the facilities.

State Aerial Firefighting Foam Support

The AEG has provided support and advice to the SAU with the development of new generation mobile bulk foam support units. The foam support units were primarily developed to provide support the high volume fire bombing helicopters. The strategy has allowed access to additional funding for modification and upgrade of the units, which now provide additional support to all aircraft operations. The strategy now also provides for the allocation of units to regional areas as well as the metropolitan area.

State Aviation Refuelling Support

He AEG has been providing advice and assisting with investigations into the design and development of a high volume (approx. 4,000lt) aviation refuelling truck module to be fitted to an existing truck for the supply of bulk Jet A1. The truck is in addition to the current fleet of hot refuelling support trucks. The truck has been purchased and the design of the refuelling module has been forwarded to two independent companies as a request for proposals.

Mobile Retardant Mixer (Eductor)

The AEG has assisted the DSE Equipment and Development Centre in the review and development of the eductor based mobile mixer. The AEG has completed a full operational evaluation of the unit and as a result has developed the training and operation manual for the unit. A final operational test will be conducted by the DSE North East Region prior to the unit being commissioned for the 2005/06 fire season.

Other developments with equipment and infrastructure include:

Aircraft Delivery Systems Program

The SAU has developed a high standard in business and service delivery for aerial fire fighting; the ADSP is an integral part of the SAU. The ADSP is recognised as conducting innovative, practical and focused investigations and evaluations servicing the needs of natural resource managers and fire authorities in Victoria, Australia and internationally. The ADSP is an investigation and evaluation program that specialises in aerial delivery systems for fire fighting aircraft. Working with the aviation industry, delivery system manufacturers, government and other organisations, ADSP provides technical information and practical solutions to enable effective application of delivery systems for wildfire suppression. In particular, ADSP has demonstrated expertise in delivery system design, drop flow management and drop pattern effectiveness.

Belly tank testing of Helitack 147

The opportunity to conduct an extensive evaluation program was limited this year because of wildfire operations and availability of resources at appropriate times. Several field investigations were undertaken to determine the suitability and assess the effectiveness of both fixed wing and rotary wing delivery systems. The ADSP also provided advice, assistance and training in the process of pilot endorsement to several aircraft operators.

Two technical research reports were published as a result of previous year's trials, data collection and evaluation.

An evaluation of the performance of the Simplex 304 helicopter belly-tank.
This trial was established primarily to evaluate the operation, general attributes and the drop pattern of the Simplex Model 304 Fire Attack belly-tank. Accordingly, this trial provided the opportunity to also establish the performance of the Conair delivery system. The objectives of the trial were to:

- observe and record data relating to ground coverage by the drop patterns delivered from the Simplex Model 304 Fire Attack and the Conair 85 retardant delivery systems,
- assess the general attributes of the belly-tank systems, and
- recommend future applications for the Department.

Operational performance of the S-64F Aircrane Helitanker: 1997-98 fire season.
This report is a summary of the management, operational performance and effectiveness of the Erickson S-64F Air-Crane helitanker during the 1997–98-fire season. It was initially prepared as an internal report to the Department in 1998. It presents important data about the Air-crane because of its relevance to future evaluations of the performance of retardant delivery systems, fire suppression operations and the management of the firefighting aircraft fleet.

Firebombing Airbase Upgrades

The SAU is coordinating DSE's airbase upgrade program, for which funding was received for 2 years. Progress is being made at various sites across the state. The primary focus of this program is to replace the current retardant mixing and delivery equipment with high volume Eductor systems that can deliver greater quantities to meet the demands of higher capacity aircraft, whilst reducing the manhandling required by personnel.

Linescan equipment

The newly developed linescanner equipment was used during this fire season, with further testing to refine the output planned for the 2005/06 season. Two units were produced under this development program, providing the state with back-up scanning equipment should the need arise.

In conjunction with the DSE Fire Information Systems Group, the development of a web based mission planning and request system is continuing with plans to trial the system during the 2005/06 fire season. This initiative will allow users to plan a mission before requesting the scanning aircraft, and access the downlinked map once the mission has been completed. This process, combined with the statewide coverage for data downlinking, will greatly improve the provision of incident intelligence.

Forward Looking Infra Red (FLIR) equipment

Certification was finalised on the new FLIR pedestal during 2004/05, making it possible to mount a FLIR unit in all State Fleet Type 3 Helicopters. This combined with the second FLIR unit, provides the added flexibility of being able to conduct FLIR operations in multiple locations simultaneously.

Partnerships

Aircraft, aircraft related equipment and infrastructure and accredited personnel are a scarce resource. This has necessitated a high level of sharing between various organisations in Victoria, with a coordinated view to utilising aircraft and their supporting services in an efficient and effective manner. These sharing arrangements have fostered strong partnerships between these organisations and formal service and supply agreements have been developed over recent times.

This year the SAU facilitated the signing of an amendment to the Melbourne Water/CFA/DSE agreement, necessitated by the engagement of a helicopter service to provide priority protection of Melbourne's water supply catchments.

The SAU also drafted a supply agreement between DSE and the newly formed VicForests. This document is still under review, however both agencies have agreed to work under the terms and conditions of the draft agreement.

Interstate Relationships

The SAU is regarded as a leader in aviation management in Australia, and is subsequently involved in assisting interstate emergency and land management organisations with the development of standards and management techniques.

The SAU provides documentation to various agencies regarding aircraft standards and has attended interstate organisations' meetings to provide input into the development of procedures and policies regarding safe aircraft use, in particular to the NSW Rural Fire Service's Aviation Policy Advisory Committee. The SAU's Aircraft Operations Coordinator also travelled to South Australia to conduct aircraft inspections

International Relationships

The SAU has enjoyed very close links with international fire and land management agencies involved in aviation, started many years ago by DSE and CFA personnel. The rappel exchange program highlighted earlier, is a terrific example of the continuing advantages to be had in maintaining open liaisons with other countries.

This year the SAU were fortunate to host Woody Smith from the USDA Forest Service. Woody is based at the National Interagency Firefighting Centre at Boise, Idaho and is involved in the operation of the infra red equipment and linescanning aircraft. Woody's trip included assisting with the further development of the data downlinking system from the linescan aircraft and improvements to the scanning equipment.

SAU Website

The current SAU website is hosted on the DSE FireWeb system and can be accessed through CFA Brigades Online. The website provides a background to the formation of the SAU, regularly updated current dispatches, details on the types of aircraft, equipment and infrastructure the SAU manage, policy, procedure and technical documentation and operational forms used at incident's. Links to the CFA and DSE websites, as well as other organisations involved with aircraft use in emergency situations are provided, as are postings of "hot topics" that arise in the aviation industry such as national accident report findings.

A business case has been developed outlining the SAU's request for a stand alone external website with a vic.gov.au domain name. The process is complex and the SAU has experienced several barriers within government in achieving approval for our own website, however we are continuing to push this project through.

Financial Summary

This financial summary covers the SAU as an entity of CFA and DSE.

	2004/05 $'000
Funding	
Funding from Commonwealth	2,013
Funding from State	5,816
Other funding (Melb. Water, VicForests, Parks Victoria)	430
Total funding	8,259
Expenditure	
Aircraft Standing Charges	(8,804)
Aircraft Operating Charges	(2,235)
SAU Business and State Airdesk Operating Charges	(107)
Other operating	(1,186)
Total expenditure	(12,332)

Appendix 1.

Publications and training documentation available from the SAU.

Publications	**Description**
Aircraft Safety Booklet	Red pocket size, 40pp
Flight Operations Return book	Numbered and controlled document to record aircraft flights
Fight Following – Flight Details & Pax Manifest	Carbon copy pocket size booklet
Air Operations Info & Checklists	Pocket size flip book
AAS Operational Report	Mandatory reporting form for Air Attack Supervisors
Airbase Resource Update pad	A4 size incident pad for Aircraft Officers & Airbase Managers
Airbase Information pad	A4 size incident pad for Aircraft Officers & Airbase Managers
Safety Guide for passenger transport aircraft	Laminated pocket guide
Flight Following procedures	Laminated pocket guide
Flight Following procedures	Laminated A4 size for offices and ICCs
AAS Flight checklist	Laminated pocket guide
Aircraft refuelling guide	Laminated pocket guide
Firebomber loading guide	Laminated pocket guide
Aircraft pre-use checklist	Laminated pocket guide
Pilot Information Handbook	A4 size book for all pilots
Cockpit Handbook	A5 size flip folder to be carried in all aircraft on Victorian operations
Firebombing Base checklist	A3 size incident pad
Air Operations Manual	A4 size folder
Air Operations Manual	CD
Airbase Information	A1 whiteboard for use at airbases
Educational documentation	
• Air Operations, • Ferrying fire crews, • Helicopter safety, • Firebombing safety • Rappel and Hover Exit	Posters
• Aircraft for firefighting bushfires in Victoria • Aircraft Identification Chart • Aerospatial Squirrel • PZL M18 Dromader • BK117 firefighting helicopter • Bell 205/212/412 firefighting helicopter • Air Tractor 802	Brochures

• S64F Aircrane quick fact sheet • Mil 8 quick fact sheet • Bell 214B quick fact sheet • Airborne infra red scanning for fire suppression • Firescan image interpretation • Milestones in firefighting and forestry aviation in Victoria • Aerial ignition operations • Forward Looking Infra Red (FLIR) • Fire Retardant • Rappel and Hover Exit • "Class A" foam • Automated Real Time Mapping System	
Effectiveness of aircraft operations by the DNRE and CFA 1997-98	Research report
An evaluation of the performance of the Simplex 304 helicopter belly-tank	Research report
Operational performance of the S-64F Aircrane Helitanker 1997-98 fire season	Research report
Training documentation	
Aircraft Refuelling Operations manual	A5 size book
Helicopter Rappel Operations manual	A5 size book
Helicopter Hover Exit Operations manual	A5 size book
Helicopter Sling Load Operations manual	A5 size book
Airbase Manager Handbook	A5 size book
Aerial Driptorch Operations manual	A5 size book
Aerial Incendiary Machine operations manual	A5 size book
Foam and Retardant Handling, Mixing and loading Operations manual	A5 size book
Helipad Marshall Handbook	A5 size book
Working Safely around Aircraft	Video and DVD