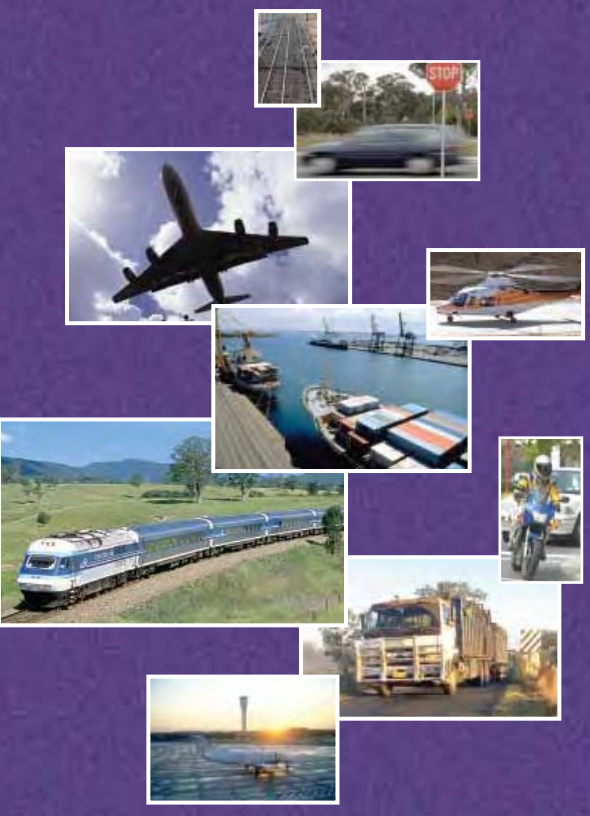
Australian Government

Australian Transport Safety Bureau

Annual Review 2004



Safe Transport

ATSB Annual Review 2004

Published by the Australian Transport Safety Bureau

ISSN 1444-4798
ISBN 1877071 84 6

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Printed by Pirion Pty Limited, Fyshwick ACT

Contents

Executive Director's message

The ATSB had a busy and productive year in 2003–04 in all modes.

In its aviation activities, the ATSB released 63 investigation reports including important reports on fatal accidents at Hamilton Island, Bankstown, Moorabbin and Toowoomba and on a Saab 340 serious icing incident near Bathurst. The Bureau generated 46 air safety recommendations including those arising from the Hamilton Island investigation, on Robinson helicopter blades, and concering the National Airspace System following a close proximity serious incident near Launceston.

The ATSB marine unit released 17 reports including on the *Doric Chariot* and the *Star Sea Bridge* accidents and also completed two reports on Sydney ferry accidents. ATSB rail outputs included an important investigation report into the Spencer Street, Melbourne 'runaway' train accident and into a level crossing accident at Aloomba in Queensland. The ATSB's twenty two 2003–04 road safety research and statistical reports included important reports on vehicle conspicuity and rural speed.

Using new 2003–04 Budget funding, the ATSB prepared and released 10 aviation research and analysis reports, developed a new rail safety investigation database (RIASIS) on time and under budget, initiated five new rail investigations on the Defined Interstate Rail Network, and established a new marine non-mandatory confidential safety reporting scheme.

During 2003–04, the *Transport Safety Investigation Act 2003* (TSI Act) and Regulations applied to all new ATSB investigations in aviation, marine and interstate rail modes. Gratifyingly, there were no major problems encountered with the new legislation.

The ATSB continued to release all of its significant safety outputs to the public and hits on the ATSB website www.atsb.gov.au again increased to an annual rate of around eight million by the end of the financial year.

Steady progress was made with jurisdictions and stakeholders on road safety but with great challenges remaining to meet or better the 2010 target of no more than 5.6 road deaths per 100,000 population and to reduce serious injuries. A particular highlight was the release of a substantial road safety publication to mark World Health Day on 7 April 2004.

On 10 November 2003, the major ATSB aviation investigation report on maintenance problems with the Ansett Boeing 767 fleet received the Flight Safety Foundation's prestigious Cecil A. Brownlow publication award at a ceremony in Washington DC. The ATSB completed the investigation into the fatal crash of an Ilyushin IL76 aircraft near Baucau in a joint investigation on behalf of East Timor with the Australian Defence Force and in cooperation with Russian investigators. The report was released on the ATSB website after the East Timor Cabinet and senior officials had been briefed by the ATSB.

The backlog of old marine investigation reports was reduced and the number of investigations on hand at 30 June 2004 was nine compared with 19 a year earlier. Unfortunately, similar progress was not made in aviation because of other pressures and constraints, including preparation for a major audit undertaken by ICAO.

The Bureau's 2003–04 achievements, including with its additional 2003–04 Federal Budget funding for new aviation safety research, rail investigation and confidential marine reporting activities, were necessarily constrained by a 10.7 percent budget reduction applied to all groups as part of the Department's 'work out/work up' strategy. However, reflecting the Government's clear priority for the ATSB's work, the Department's Executive decided to exempt ATSB from the further round of planned Budget reductions which was required across the remainder of the Department in 2004–05. The Bureau was grateful for Federal Budget funding announced in May 2004 to ease pressures in aviation investigation and to enable replacement of the OASIS aviation safety database.

During the year the Bureau continued to liaise with and seek to improve cooperation and mutual understanding with Coroners around Australia and agreed the terms of a template memorandum of understanding (MoU) with the Coroner's representative, the Chief Magistrate of Tasmania, Mr Arnold Shott, with whom an MoU was signed in June.

A number of valued staff members retired during the year or prior to publication of this Review. I acknowledge in particular the contributions of Chris Brooks in road safety, Nick Rutherford in marine investigation and Rob Graham in leading safety investigations and work on IT systems.

I am grateful to the Deputy Prime Minister and Minister for Transport and Regional Services, the Hon. John Anderson and to the Secretary of the Department of Transport and Regional Services, Mr Ken Matthews, for their support throughout the year. It was also a pleasure working with Minister Campbell on road safety prior to his elevation to Cabinet in July 2004 and replacement by Minister Lloyd. The ATSB was again grateful for the bipartisan support it received for its safety work. The ATSB's ongoing effective role as the Australian Government's primary transport safety investigator remains reliant on both the perceptions and reality of its independence, fairness and professionalism.

Kym Bills

ATSB mission statement

Objective

Safe transport.

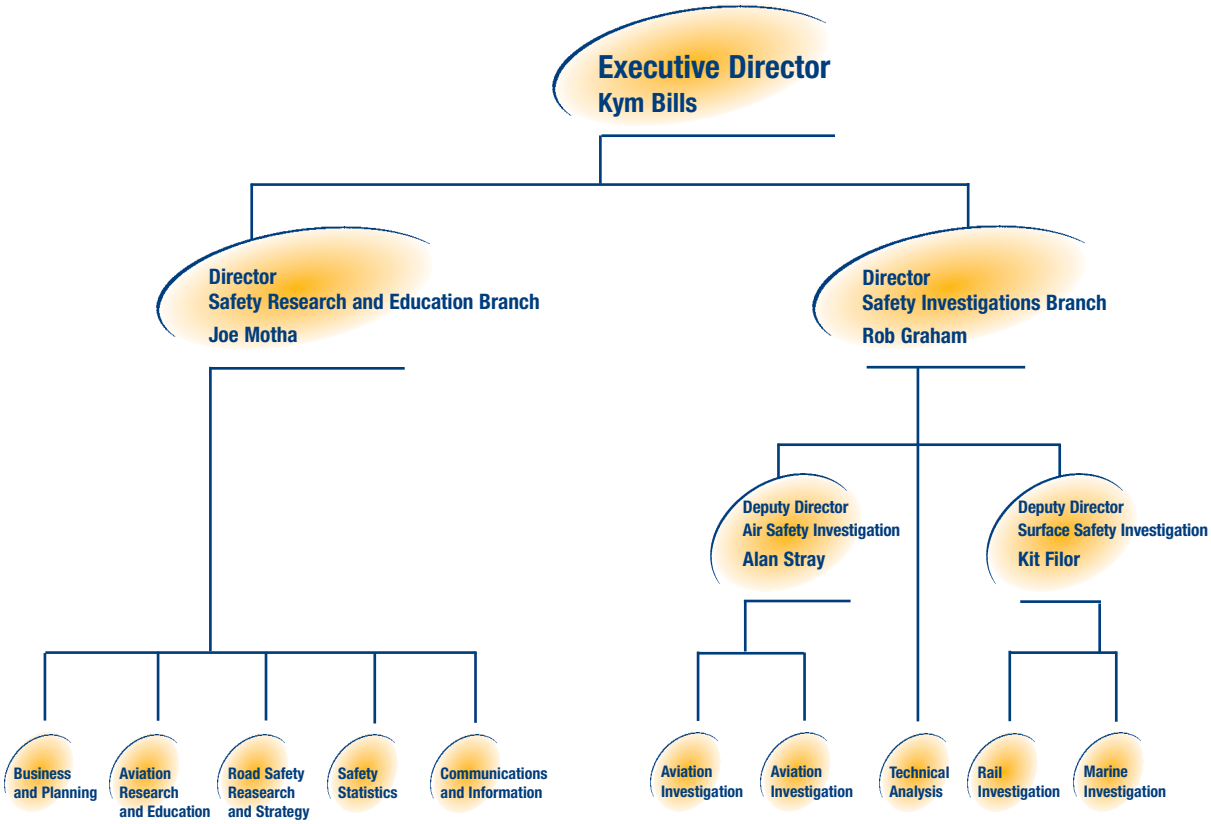
Our mission

The aim of the Australian Transport Safety Bureau is to maintain and improve transport safety and public confidence through excellence in:

- independent investigation of transport accident and other safety occurrences;
- safety data research and analysis; and
- safety communication and education.

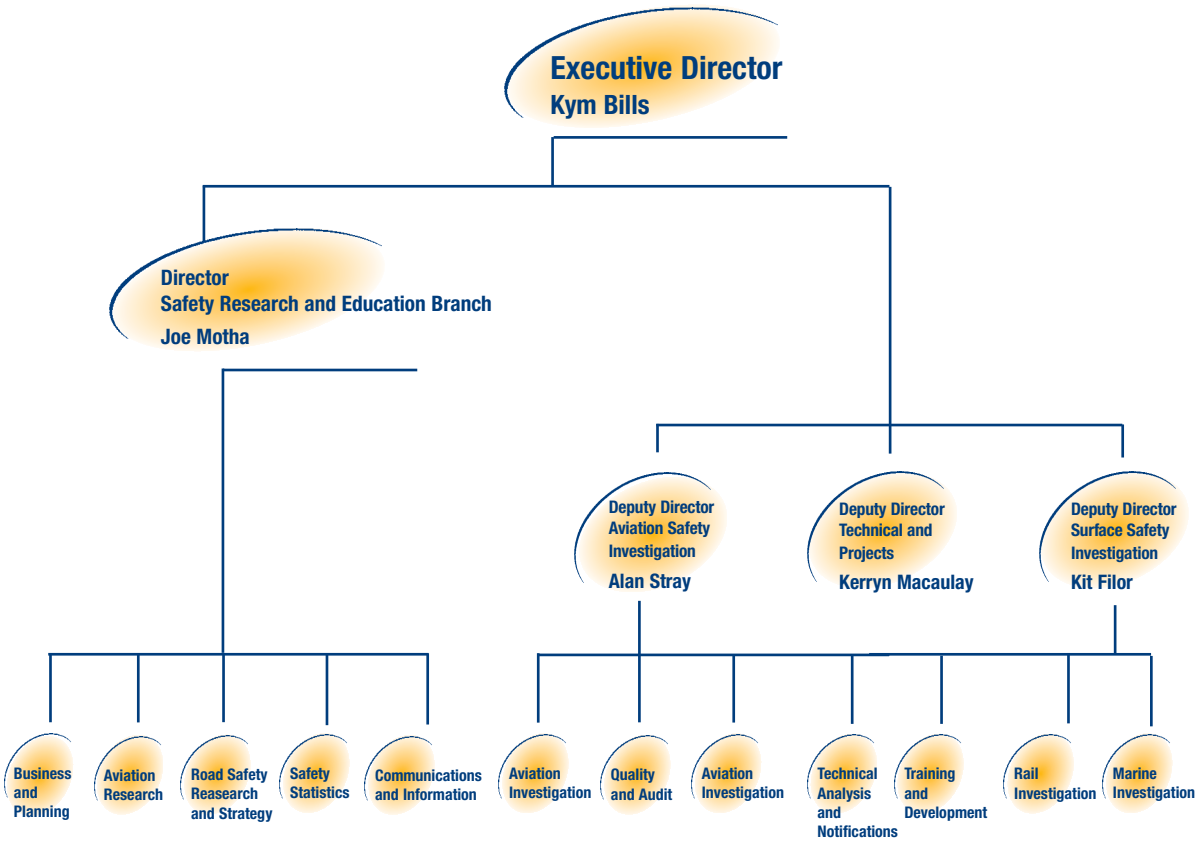
ATSB organisation chart

as at 30 June 2004



ATSB organisation chart

as at 30 September 2004



Executive profile

Mr Kym Bills

Executive Director
Kym Bills

Kym Bills was appointed Executive Director of the newly formed Australian Transport Safety Bureau on 1 July 1999. Prior to his current position with ATSB, Mr Bills was First Assistant Secretary of the Department's Maritime Division from 1994. He was also a Director of ANL Limited during its restructuring from September 1995 to the signing of sale contracts at the end of 1998 and a member of the Board of the Australian Maritime Safety Authority from 1995 to 1997. In 1998, Mr Bills led negotiations at the International Maritime Organization, which established a new legal regime for archipelagic sea lanes including a precedent case for protecting Australia's shipping and other interests through the Indonesian archipelago.

In addition to Transport, Mr Bills has held a number of Australian Government public service positions since 1978 including in the Department of Foreign Affairs, the Office of National Assessments, the Department of Immigration and Ethnic Affairs, the Department of Finance, and the Department of Workplace Relations and Small Business. Mr Bills holds degrees from the universities of Adelaide, Flinders, Oxford and the ANU and is a fellow of a number of professional bodies.

Mr Joe Motha

Director
Joe Motha

Joe Motha became the Director of Safety Research and Education in September 2002. From July 1999 to September 2002, he was Deputy Executive Director, Sea, Air and Safety at the Bureau of Transport and Regional Economics (BTRE).

During his 13 years with the BTRE in its various forms, Mr Motha researched various transport issues including transport safety, accident costing, valuation of life and injury in transport accidents, and transport-related environmental issues. His individual and team-based work has resulted in a number of research papers and reports. In 1997, a research team led by Mr Motha won the Australasian Evaluation Society's best public sector evaluation study award for a report on the federal government's Black Spot Road Safety Programme.

Before joining the then Bureau of Transport and Communications Economics in 1989, Mr Motha worked in the Maritime Policy Division of the former Department of Transport and Communications. His public service experience also includes periods with the Australian Taxation Office, the former Inter-State Commission and the former Department of Primary Industry. Mr Motha also has overseas experience in industry, shipping and commerce.

Mr Motha has tertiary qualifications in science, economics, international affairs and business administration.

Mr Rob Graham

Director
Rob Graham

As Director of Safety Investigations, Rob Graham was responsible for aviation, marine and rail investigation until 17 September 2004. He joined the ATSB in June 2001, having previously worked for the New Zealand Civil Aviation Authority (NZ CAA) as General Manager, Aviation Services. There he was responsible for airport operations, air traffic control, Part 141 training, licensing, search-and-rescue and aviation security.

Prior to the NZ CAA, Mr Graham was Director of Safety and Environment within Airservices Australia. Having worked in aviation since 1972, he has extensive experience in safety management, air traffic control, aviation systems implementation and CNS/ATM.

Captain Kit Filor, PSM

Deputy Director
Kit Filor

Kit Filor is the Deputy Director of Surface Safety Investigation and is responsible for marine and rail safety investigations.

After a career at sea on tankers and as master on cross-channel ferries in the UK, Captain Filor and his family emigrated to Australia, where he took up a position as a Commonwealth marine surveyor in Devonport. After two years, he moved to Canberra to the Ship Operations Section in the Marine Safety Division. He became increasingly involved in marine casualty investigation.

Captain Filor was appointed Inspector of Marine Accidents on 1 January 1991 when the Marine Incident Investigation Unit was formed as an independent investigation body separate from the regulator (what became the Australian Maritime Safety Authority).

Captain Filor was instrumental in formulating the International Maritime Organization (IMO) Code for the Investigation of Marine Casualties and Incidents. He has re-written the IMO Model Course for the Investigation of Marine Accidents and Incidents and is a regular lecturer at the International Maritime Academy in Trieste, Italy. He is chairman of the Marine Accident Investigators' International Forum.

In 1996, he was awarded the Public Service Medal in the Queen's Birthday Honours for services to marine safety. Captain Filor also holds a Diploma of Transport Safety Investigation.

Mr Alan Stray

Deputy Director
Alan Stray

Alan Stray is Deputy Director of Air Safety Investigation. He has been an air safety investigator with the ATSB and its predecessor, the Bureau of Air Safety Investigation, since January 1987.

Mr Stray has managed all areas of ATSB's aviation investigation operations and, from January to June 2001, acted as Director of Safety Investigations. In recent years, he has secured, on behalf of the Bureau, memorandums of understanding with government and aviation agencies in Asia-Pacific and the Russian Federation.

Between 1992 and 1994, Mr Stray was an exchange officer with the Transportation Safety Board of Canada. While serving there as a management investigator, he developed Reflexions, a multimodal safety magazine modelled on the successful BASI Journal, which he had produced in Australia for several years.

Mr Stray is a licensed aircraft maintenance engineer, holds an Airline Transport Pilot Licence, and has flown in Papua New Guinea, Canada, the USA and Australia in a variety of piston-engine and turbo-prop aircraft types. He holds a Diploma of Transport Safety Investigation and management qualifications.

Ms Kerryn Macaulay

Deputy Director
Kerryn Macaulay

Kerryn Macaulay is the Deputy Director of Technical and Projects and is responsible for the oversight of the Technical Analysis team, legislative matters affecting the ATSB, the training and development needs of Bureau staff, and major projects including replacement of the OASIS aviation safety database.

Kerryn is a commercial pilot and flight instructor with an Airline Transport Pilot Licence. She joined the then Bureau of Air Safety Investigation (BASI) in 1995 as an Air Safety Investigator. Kerryn managed the Safety Analysis Branch of BASI, which included the review and release of Safety Recommendations and safety study reports to organisations within the aviation industry including regulatory agencies, operators and manufacturers.

Since the formation of the ATSB in 1999, Kerryn assisted in developing a capacity to investigate rail accidents and incidents and was appointed as the first Team Leader to the Rail Safety Unit. Kerryn completed a three year project to develop and implement Commonwealth multi-modal legislation, which culminated in the introduction of the *Transport Safety Investigation Act 2003* and which enabled the ATSB to investigate accidents and serious incidents on the interstate rail system in addition to the investigation of accidents and incidents in the aviation and marine transport modes.

Kerryn also assisted the Bureau to become a Registered Training Organisation and to develop a Diploma of Transport Safety Investigation, which enables the Bureau to more adequately meet its unique training requirements. Kerryn is a trained teacher and holds a Diploma of Transport Safety Investigation.

In October 2003, Kerryn was seconded to the newly established NSW Independent Transport Safety and Reliability Regulator for a period of eight months to assist in setting up the Office of Transport Safety Investigation, including the development of investigation protocols and the establishment of a confidential reporting scheme for employees of the rail, ferry and commercial bus industries.

Modal overviews

Road

Role

The ATSB aims to improve national road safety by:

- undertaking research projects
- collecting and analysing statistics
- coordinating the National Road Safety Strategy and Action Plans
- providing safety, education and information material.

Key safety activities and results

The ATSB continued to monitor and report on road safety progress under the National Road Safety Strategy framework approved by Ministers of the Australian Transport Council (ATC). Chairing and working with the National Road Safety Strategy Panel, the ATSB maintained close ties with state and territory transport agencies and other major stakeholders. During the year, the ATSB coordinated the implementation of the National Road Safety Action Plan for 2003 and 2004 and the development of the next plan for 2005 and 2006.

The Bureau released 22 research and statistical publications, including well publicised reports on speed limits on rural roads, vehicle conspicuity, and a substantial book on road safety to mark World Health Day on 7 April 2004.

National Road Safety Strategy and Action Plans

In November 2000, the ATC approved the National Road Safety Strategy for 2001–2010 and an associated Action Plan for 2001 and 2002. The National Strategy provides a framework that complements the strategic road safety plans of state, territory and local governments and other stakeholders. It aims to reduce the yearly number of road fatalities per 100 000 population by 40 per cent from 9.3 in 1999 to no more than 5.6 in 2010.

A second Action Plan, for calendar years 2003 and 2004, was endorsed by all Ministers at the Australian Transport Council meeting on 8 November 2002. This Action Plan provides a focus on

priority measures for achieving better safety outcomes, including more effective speed management, expansion of road-based treatments, enhanced drink-driving deterrence and measures to reduce fatigue-related harm.

The ATSB and the National Road Safety Strategy Panel monitor and report on the National Strategy's progress. During 2003–04, the ATSB:

- convened and chaired two Panel meetings
- coordinated the preparation of a progress report for the ATC
- started work on development of an Action Plan for 2005 and 2006.

Road safety research programme

Input from the ATSB's road safety research programme helps the Australian Government to formulate and review its road safety policies in consultation with jurisdictions and partner organisations. It also contributes to work on vehicle safety standards undertaken within the Vehicle Safety Standards Branch of the Department of Transport and Regional Services.

In accordance with long-standing practice from the former Federal Office of Road Safety, most research projects are contracted out to private sector consultants or academics. ATSB officers identify the directions, manage the projects, exercise quality control, use the material in advice, and incorporate it in key safety messages. The programme includes research projects on road-user, vehicle, and road infrastructure safety.

In 2003–04 the ATSB released four road safety research reports which are itemised in Appendix 1. The ATSB disseminates research reports widely in print form and through its website using a 'CR Report' sequence. Reports published between 1979 and 2001 are also available in a set of fully text-searchable CD-ROMs.

Speed limits on rural roads

In recent years, speed has been a priority issue in Australian road safety and a major focus of the research programme. ATSB studies on speed-related risk have continued to be widely cited in policy papers produced by other agencies (both in Australia and overseas) and have supported a number of major public education campaigns around the nation.

In November 2003 the ATSB published a rural speed report by Monash University Accident Research Centre (MUARC), which investigated the economic benefits and costs of different speed limits on rural roads, including the option of variable speed limits for light vehicles on rural freeways.

On rural roads, higher travel speeds can be expected to result in economic savings from reduced travel times, but an increase in costs associated with crashes, and increased fuel and emission costs.

The MUARC report analysed the net costs and benefits of different speed limits on a range of road classes from two-lane undivided roads to freeways. For each road class, the study also determined an economically 'optimum' speed, defined as the speed that would minimise total economic costs.

The study found that:

- increasing truck travel speeds above 100 km/h would increase net costs on all road types, with the optimum speed for trucks below 100 km/h on lower standard roads;
- the economically optimum speed for light vehicles on freeways was between 115 and 125 km/h, depending on the methods used to value travel time and crash costs;
- the economically optimum speed for light vehicles on sealed undivided rural roads ranged from 85 to 105 km/h, depending on road standards and the presence of curves or intersections;
- a variable speed limit (VSL) system on freeways, allowing speeds of 120 km/h for light vehicles during good conditions, but reduced to 100 km/h under higher risk conditions (including night driving), with trucks limited to 100 km/h at all times, would reduce total economic costs below current levels;
    - this VSL option would increase casualty crash costs by 7 per cent, increase vehicle operating costs by 1 per cent and reduce time costs by 4 per cent; based on standard Austroads cost estimates, this would give a net saving of 0.6 per cent per year in total social costs (a reduction of $2.3 million per year per 100 km of freeway);
- all options that produced net time savings through increased speeds would tend to increase fatalities and casualty crash costs, but the VSL option on freeways would involve considerably smaller casualty increases than other options for higher speeds. The estimated increase in fatalities was one fatality per year per

500 km of freeway (compared with 14 additional fatalities per year per 500 km for a fixed speed limit of 120 km/h for all vehicles on freeways);

- the overall findings indicate that aggregate costs might be reduced by varying speed limits over a wider range, matched to the crash risks on different roads.

Vehicle conspicuity

The potential to reduce crashes by making vehicles more conspicuous is an ongoing subject of interest in road safety. During 2003–04, the ATSB released the final reports from two reviews on conspicuity-related issues in response to requests from the Australian Transport Council:

- one investigated the costs and benefits of requiring all road vehicles to be equipped with automatic daytime running lights (DRL)
- The other examined the scope for enhancing the conspicuity of trains to reduce railway level crossing collisions, with a focus on the potential benefits of further research in this area.

These studies were commissioned in 2002–03.

The report on DRL, prepared by ARRB Transport Research, concluded that there is a substantial body of international research evidence showing that DRL are effective in reducing daytime crashes.

However, the report noted that:

- the estimated size of the reduction varies between studies
- from the available data, it is difficult to predict how beneficial or how cost-effective mandatory DRL would be in Australia.

This work will contribute to the Department's preparation of a Regulation Impact Statement (RIS) on options for an Australian DRL requirement.

The report on train conspicuity research, prepared by ARRB Transport Research, concluded that:

- there is evidence that auxiliary lights (including 'crossing lights' and strobe lights) do make trains more noticeable and can improve estimations of time to arrival, compared with train headlights alone

- visibility benefits of multiple auxiliary lights (such as adding a strobe light to a train already equipped with crossing lights) are less clear
- there is presently insufficient research evidence on enhanced lighting treatments to estimate the proportion of collisions at passive crossings that they would prevent
- some visibility measures, such as 'crossing lights' and 'ditch lights', are already becoming accepted as best practice measures
- with these visibility enhancements already gaining acceptance as part of good practice, it is not clear that additional visibility measures would produce worthwhile safety gains
- if further research were to proceed, then models and field trials would best help determine if any form of additional lighting would enhance visibility above levels already available from crossing lights. The estimated cost of this preliminary research was $225,000 and it would not provide a basis for quantifying potential safety gains.

On the basis of this research review, Ministers at Australian Transport Council noted that the practical benefits of further research on improving train conspicuity were uncertain and that Rail Group should take this into account when assessing the total range of research and countermeasure options for improving level crossing safety.

Road safety research grants

On a regular basis, the ATSB makes available several small competitive road safety research grants. The scheme invites researchers and community groups to submit innovative research ideas. Appendix 2 includes road safety seeding grants awarded in 2003–04.

Novice driver education

The marked over-representation of young novice drivers in road fatality and injury statistics prompted Minister Anderson to propose a national programme of post-licence driver education at the Australian Transport Council meeting on 23 May 2003. In October 2003, the Standing Committee on Transport considered an Austroads report, reviewing promising results from a new driver development programme in Finland. The ATSB has since commissioned consultants to develop a best-practice curriculum for a driver development programme.

The next step is for a major trial, supported by industry, to be undertaken and evaluated. The vehicle industry has offered to contribute up to $1 million towards the cost of a trial and the Australian Government, through the ATSB, has proposed to contribute $1 million. Further funding is being sought from a state government or governments and the insurance and other industries.

House of Representatives Committee Report on Road Safety

The House of Representatives Standing Committee on Transport and Regional Services (Neville Committee) tabled its report *National Road Safety: Eyes on the Road Ahead* on 21 June 2004. The Committee put forward a wide range of recommendations for further improving safety on Australia's roads and acknowledged the important work that has already been done on developing and implementing the National Road Safety Strategy. The ATSB is coordinating a draft response to the Report.

Participation in road safety forums

Austroads

Austroads is the association of Australian and New Zealand road transport and traffic authorities. As the road modal group of the ATC, it advances Australia's broader transport agenda. Austroads' core activities consist of six programme areas, each managed by a senior officer from a member organisation. The ATSB's Director of Safety Research and Education managed Austroads' Road Safety Programme until March 2004 when the role was transferred to another jurisdiction. However, he continued to function on the Austroads Road Safety Task Force.

The ATSB's participation in the Austroads Road Safety Programme allowed the ATSB to influence and contribute to the national road safety agenda. Between July 2003 and March 2004 ATSB officers:

- advised and provided administrative assistance to the Austroads Road Safety Programme Manager
- helped manage several Austroads research projects
- coordinated the activities of the Austroads Research Coordination and Advisory Group (RCAG).

The RCAG advises the National Road Safety Strategy Panel and the Austroads Road Safety Programme Manager on research priorities and coordinates road safety research between Australian jurisdictions.

Austroads road safety publications released in 2003–04 under ATSB guidance included:

- *Combined Medical Guidelines for Assessing Commercial and Non-commercial Drivers for Fitness to Hold a Driving License*
- *High Risk Road Users and Intelligent Transport Systems*
- *Treatment of Crash Locations*
- *Australasian Road Safety Handbook, Volume 1*
- *Use of Accident Costing for Countermeasure Evaluation in Australia – Stage 2*
- *Implications of Intelligent Transport Systems for High Risk Road Users and High Risk Situations*
- *A Review of Literature and Trials of Intelligent Speed Adaptation Devices for Light and Heavy Vehicles*
- *Heavy Vehicle Compliance with Speed and Mass Limits: Evidence from Weigh-in-Motion Devices*

National Road Safety Strategy Panel

The ATSB convenes, chairs and provides secretariat services to the National Road Safety Strategy Panel. The Panel meets twice a year and brings together key stakeholders in road safety. These include representatives of transport agencies, police, user groups and industry. The Panel:

- coordinates national research on road safety issues
- provides a forum for jurisdictions to share experiences on road safety initiatives and outcomes
- advises the ATSB's Executive Director and Austroads' Road Safety Manager
- monitors implementation of the National Road Safety Strategy and Action Plan.

Motorcycle Safety Consultative Committee

The ATSB chairs the Motorcycle Safety Consultative Committee, which usually meets twice a year in Canberra. The Committee provides a forum where the Australian Government (represented by

the ATSB and other departmental staff as appropriate) and major rider associations can address national motorcycle safety issues.

Fleet Safety Forum

The ATSB participates with state and territory road safety agencies, university research centres and other national bodies in a Fleet Safety Forum to explore the possible road safety benefits of workplace-based fleet safety programmes. The Forum aims to facilitate fleet safety improvements, at both a macro policy level and in Australia's various government-operated vehicle fleets. The ATSB attended the Forum meeting in November 2003.

National Summit to Combat Speeding Heavy Vehicles

The ATSB was represented at a summit organised by the Australian Trucking Association and the National Transport Commission, to focus on the problem of speeding heavy vehicles. The Summit, held in March 2004, was attended by senior industry representatives, police, and officials from government transport agencies around Australia.

The ATSB contributed a paper on the safety consequences of excessive heavy vehicle speeds.

Heavy Vehicle Safety Strategy Task Force

This task force, chaired by the National Transport Commission, meets twice a year to facilitate implementation of the National Heavy Vehicle Safety Strategy, and monitor progress.

NSW Country Road Safety Summit

The ATSB chaired a working group on speed issues at this summit, which was held in May 2004 to review safety on country roads and provide recommendations for action. The Summit was attended by 28 Members of the NSW Parliament, from both Houses and representing all major parties. Representatives of industry groups, Police, Local Government, the NRMA, the Australian College of Road Safety, road safety experts and academics, road safety and health professionals from across Australia, community groups, indigenous community representatives, educators and emergency services personnel also attended the summit.

Indigenous Road Safety Working Group and Forum

The ATSB chairs the Indigenous Road Safety Working Group, which advises the National Road Safety Strategy Panel on indigenous

issues. Members include representatives from federal, state and territory agencies. In 2003–04, the ATSB commenced planning a national Indigenous Road Safety Forum to be held on 27 and 28 September 2004 in Alice Springs. The ATSB is arranging the event in partnership with the Northern Territory Department of Infrastructure, Planning and Environment.

Australasian Traffic Policing Forum

The Australasian Traffic Policing Forum (ATPF) was originally established to foster best practice in road safety and traffic law enforcement among state Police Services. Its current membership includes senior traffic police managers from all Australian states and territories, New Zealand and Fiji. The ATSB is also a permanent member of the Forum, with a particular role in supporting constructive linkages between police and other road safety organisations. The ATPF normally meets twice a year. In 2003–04, the ATSB attended a one-day meeting that was held in Sydney (September 2003) and a two-day meeting in Queenstown, New Zealand (May 2004).

National road safety statistics

The ATSB collects, analyses and reports national statistics on road fatalities and other data to help develop and evaluate road safety measures. Among these reports are monthly releases of national road safety statistics and annual publications that draw comparisons with other OECD countries. Work undertaken in 2003–04 has led to important new datasets to supplement these collections:

- Australian Truck Crash Database. The ATSB has been working with states and territories to develop the Australian Truck Crash Database. The database details serious-injury and fatal crashes involving articulated trucks and heavy rigid trucks. The ATSB is analysing and evaluating the data provided for the years 2000 and 2002.
- Serious injury due to road crashes. The need for reliable national statistics on road injury has been on the agenda of the National Road Safety Strategy Panel for some time, and the ATSB is pleased to be able to report progress in this area. The ATSB has issued a bulletin titled *Serious injury due to road crashes*, which is available on the ATSB web site. The bulletin uses hospital data to examine trends in road injury since 1999.

ATSB statistical reports for 2003–04

The ATSB released 13 road fatality statistical reports and four special-issue statistical reports.

The ATSB's Working Paper: *Heavy truck crashes at 500 to 1499 kilometres outward distance from base, 1998 to 2000*, was an analysis of claims data received from National Transport Insurance Ltd. The data show that the majority of the crashes in the category occurred during the day, particularly during the morning quarter (6am-noon). The two dominant crash types were where the truck hit a third party in the rear and where it ran off the road. About half of the major crashes (minimum $10 000 claim) were possibly fatigue or speed related, and the most critical time for all possibly fatigue or speed-related crashes appeared to be between 3am and 8am. Where truck driver fatigue was assessed as being implicated, the later in the day that the trip began, the shorter was the distance covered prior to the crash.

2004 World Health Day Road Safety Publication *Road Safety in Australia*

For the first time the World Health Organisation dedicated World Health Day 2004 to road safety. As a contribution to the commemoration of World Health Day, the ATSB compiled and produced a comprehensive publication *Road Safety in Australia* which the former Minister said will make a significant contribution both in Australia and overseas to raise awareness of key road safety issues and to contribute to a safer road environment for all. The report was distributed to around 3,000 stakeholders, libraries, government departments, high schools and community groups. Hard copies of the publication are available from atsbinfo@atsb.gov.au or electronic copies are downloadable from www.atsb.gov.au.

Public education

The ATSB plays a significant role in determining the nature and direction of the national road safety agenda by ensuring that road safety retains high community visibility as a crucial social issue. The ATSB fulfils this role by surveying community attitudes and distributing a range of road safety materials to stakeholders and the general public.

In 2003–04 the Bureau commissioned and released a new DVD alternative version of the popular *Ride On* motorcycle safety video. The *Ride On* DVD highlights safe motorcycle riding techniques as

well as the need to develop mental alertness and self control. Through practice, these key points can become life saving habits, enabling riders to avoid harm. They are not substitutes for personal training by qualified instructors.

Ride On has been in strong demand from motorcycle training groups and motorcyclists for over five years for its practical instructions and easy to follow advice. The DVD provides sharper (720 by 576 pixel) resolution picture quality and enables viewers to access its five chapters separately or serially. High skill levels for motorcyclists are vital and the *Ride On* DVD is a great instructional tool for motorcycle trainers and for current and budding motorcyclists.

The World Health Day *Road Safety in Australia* publication previously mentioned was one of the more challenging and rewarding desk top publishing tasks undertaken by the ATSB's publishing staff. This publication incorporated a large number of high quality photos and illustrations and materials drawn from a variety of sources and was well received throughout Australia and overseas.

Rail

Role

The ATSB conducts rail safety investigations on the Defined Interstate Rail Network under the *Transport Safety Investigation Act 2003* (TSI Act) and undertakes rail investigations at the invitation of State authorities under state legislation. The ATSB also coordinates the publication of the National Rail Occurrence Database, from data supplied by the various state and territory rail regulators.

Key safety activities and results

In 2003–04, the ATSB initiated five rail safety investigations under the TSI Act 2003. During the year the ATSB completed investigations at the request of state authorities into Victoria's Spencer Street 'runaway train' accident and the rail level crossing accident at Aloomba, Queensland, both completed in December 2003, and had ongoing involvement in the fatal level crossing accident at Benalla, Victoria. Also the Bureau completed its investigation into the derailment and subsequent collision at Chiltern, Victoria between a

freight train and a passenger train. The investigation was conducted under Victorian legislation and the final report has been sent to the Victorian Minister of Transport for his consideration.

Rail investigations completed in 2003–04

Spencer Street Station rail accident

In February 2003, the Department of Infrastructure, Victoria, asked the ATSB to conduct the investigation into an incident involving a train on the Melbourne urban network.

Shortly before 2118 on 3 February 2003 a driverless empty suburban train, numbered as 5264, rolled away from Broadmeadows Station. The train left the station under the influence of gravity and subsequently ran largely downhill for 16.848 kilometres to Platform Two at Spencer Street Station where it collided with a stationary country passenger train scheduled for Bacchus Marsh. The impact speed was about 75 km/h. Four injured passengers from the stationary train were treated on site and four were conveyed to local hospitals. None of the injuries was serious.

The investigation report released in December 2003 found that Train 5264 rolled away from Broadmeadows Station when the brakes released while the driver was in the process of 'changing ends'. On his way to the leading end of the train the driver had diverted to the station lavatory during which period the train had rolled away. The investigation determined that the release of brakes was due to the manner in which the driver's controls were isolated and that the unplanned movement was due to the park brake not being applied. Also the procedures under which the driver was operating were fragmented and inappropriate.

Within 48 hours of the accident, the Victorian safety regulator mandated that the park brake, in addition to the air brakes, must be applied every time a driver left the cabin, whether for changing ends or any other purpose.

Importantly, a technological solution has also been developed to ensure that if the park brake isn't applied, a switch will *automatically* turn it on when the driver turns off the power of the train. It is expected that by October 2004. the switch will be installed in every Comeng train, and all Hitachi trains that are being retained in service. New trains already have an automatic park brake application.

Level crossing accident at Aloomba Queensland

At the invitation of the Queensland Government, the ATSB led an investigation into a collision at a level crossing near Aloomba, Queensland, between a scheduled passenger train and a private car on 23 May 2003. The collision resulted in the death of one person and serious injury of another. The report was released by the Queensland Minister for Transport in December 2003.

The ATSB recommendations arising from the Spencer Street Aloomba and Chiltern rail accident investigation reports are detailed in Appendix 4.

Investigations in progress at 30 June 2004

Under the provisions of the *Transport Safety Investigation Act 2003*, the ATSB is investigating:

- the derailment of a freight train near Bates, South Australia, on 9 November 2003
- the derailment of a freight train at Ararat, Victoria, on 28 November 2003
- the near head-on collision of a freight train with an empty passenger train near Sandgate, NSW, on 25 February 2004
- the derailment of a freight train near Alumatta, Victoria, on 15 March 2004
- a Signal Passed At Danger (SPAD) incident near Murarrie, Queensland, on 28 June 2004.

At the invitation of the Victorian Government, the ATSB is finalising an investigation into a collision at a level crossing between a special charter passenger train and a B-double truck at Benalla, Victoria, on 13 October 2002. The collision resulted in the death of three people and serious injury to one, all of whom were travelling on the locomotive footplate.

National Rail Occurrence Database

The ATSB is continuing to develop the National Rail Occurrence Database in cooperation with state rail safety regulators. The Bureau released four reports based on the database during 2003–04, three on latest railway accident fatalities data, international comparisons and historical comparisons, and one on level crossing accident fatalities.

These reports are available on the ATSB's website.

Participation in rail safety forums

During 2003–04, the ATSB participated in several rail safety forums. Participation helps the Bureau communicate the safety message, maintain its industry contacts, and stay informed on relevant policy and technical issues.

The ATSB continued to liaise with state authorities at their request to explain the provisions of the *Transport Safety Investigation Act 2003* and ongoing development of safety databases, and associated matters.

The Bureau attended and assisted at one meeting of the Standing Committee on Transport and one meeting of the Rail Group. It also provided relevant briefings within required timeframes for these meetings.

The ATSB was also represented at the First International Confidential Reporting System User Forum and the Global Rail Accident Investigation Forum in December 2003 and at a forum convened in May 2004 by the National Transport Commission and the Australasian Railway Association.

Training for rail industry personnel

Five rail industry staff, representing track access providers and rail accreditation authorities, completed an ATSB human factors training course in Canberra, one in November 2003 and four in May 2004.

Marine

Role

Accident investigation

The ATSB's Marine Investigation Unit (MIU) investigates accidents and incidents involving Australian-registered ships anywhere in the world and foreign ships in Australian waters or en route to Australian ports. The purpose of marine investigations is to enhance safety at sea by determining the factors contributing to accidents and incidents.

Since 1 July 2003, the MIU has investigated new marine accidents under the provisions of the *Transport Safety Investigation Act 2003* (TSI Act) and associated regulations. Under the TSI Act, accidents, incidents and potential incidents must be reported to the ATSB. Depending on the type and severity of an occurrence, the Executive

Director of the ATSB may decide that an investigation will be conducted. Other action may be:

- to seek more information from an owner, operator, crew or appropriate bodies
- only to enter details of the incident into the marine database.

Every investigation results in a published report which includes the facts of the incident, an analysis, conclusions and recommendations. The reports do not seek to assign fault or to determine civil or criminal liability and the results of investigations are not binding on the parties to any legal, disciplinary or other proceedings.

The ATSB distributes its marine investigation reports and safety and educational material nationally and internationally and promote marine safety in Australia and overseas. The Bureau sends about 1000 copies of each report to Australia's maritime community and educational institutions, to marine administrations in Australia and abroad, and to overseas maritime colleges and universities. All reports are available on the ATSB's website.

Confidential Marine Reporting Scheme

On 20 May 2004, the ATSB commenced operating a Confidential Marine Reporting Scheme (CMRS). The scheme enables the ATSB to receive, assess and act on confidential reports to improve safety in Australian waters.

The ATSB operates the CMRS under the provisions of the Navigation (*Confidential Marine Reporting Scheme) Regulations 2004* which apply to marine activities associated with the operation or safety of a ship to which the *Navigation Act 1912* applies.

The CMRS encourages the reporting of safety issues by ship's crews and others in the marine industry. For instance, a passenger on a ship or a person ashore who observes a marine safety issue and wishes to report the matter may use the scheme.

Matters which may be reported under the scheme include:

- unsafe navigation
- defective lifesaving equipment
- extreme corrosion of the hull
- crew schedules resulting in fatigue
- unreported accidents or near misses.

When dealing with reports, any reference to or any information that might identify a reporter is removed to 'de-identify' the report. The de-identified information may be sent to the Australian Maritime Safety Authority (AMSA) or used in alert bulletins or information briefs to the maritime community. Reviews of information from reports will be published and the effectiveness of the scheme will be periodically assessed by a committee established for that purpose.

Under the TSI Act, the ATSB operates a mandatory reporting system for marine accidents or near accidents. The CMRS separately aims to obtain voluntary reports of unsafe practices, procedures or conditions and take action to prevent or minimise the risks of accidents. The scheme is not intended for reporting accidents or incidents that are reportable under mandatory reporting requirements. Neither is the scheme intended for reporting industrial relations issues or unlawful interference with a ship. Details of the scheme and reporting forms are available from the ATSB's website.

Key safety activities and results

In 2003–04, the ATSB was funded for up to ten new marine investigations and commenced investigating eight incidents. Seventeen marine investigation reports were published, nine in a shortened report format. In addition, the Bureau initiated and completed two investigations into ferry accidents that occurred in Sydney in February 2004.

The seventeen investigation reports released comprised: four groundings, fatalities on bulk carriers in four separate incidents, three collisions involving ships and fishing vessels (one resulting in a fatality), three fires, a lifeboat accident, an engine failure and the loss of a fishing vessel at sea.

The ATSB released the report of the collision involving the bulk carrier *Star Sea Bridge* and the fishing vessel *Sue M* after the trial of the ship's master and second mate, some 32 months after the incident. Finalisation had been delayed pending the trial.

In November 2003, the Deputy Director Surface Safety chaired the Marine Accident Investigators' International Forum (MAIIF) annual meeting in Chile. In March 2004 a member of the unit attended the 12th meeting of the Flag State Implementation Sub-Committee at the International Maritime Organization (IMO) in London, participating in the working group on casualty analysis and statistics.

During 2003–04 the MIU considerably expanded its database capabilities. The ATSB's marine casualty database MIASIS (Marine Incident Analysis and Safety Information System) was substantially enhanced to facilitate the storage and retrieval of additional casualty information and improved management of investigation recommendations. Also, a separate Confidential Marine Reporting Scheme database was developed where de-identified reports (with no reference to details of reporters) are stored. This database will help the MIU to administer the CMRS and to analyse trends in unsafe practices, procedures or conditions.

Key investigation reports published during 2003–04

Doric Chariot

On 26 July 2002, the Greek-registered bulk carrier *Doric Chariot* sailed from Hay Point, Queensland, for India via the inner passage of the Great Barrier Reef with a Reef pilot on board.

On 29 July, approaching Piper Reef, the pilot gave the officer of the watch instructions as to where he was to be called and lay down on the daybed in the wheelhouse to rest. The ship continued under the direction of the officer until the pilot was next called. When the pilot looked up, he realised that the vessel was west of its course and was approaching the southern end of Piper Reef. He ordered full starboard rudder and, soon afterwards, 'full astern' but a minute or so later, the ship ran aground just south of Piper Reef light.

On 6 August 2002, the ship was refloated. No injuries or pollution resulted from the grounding. On 7 August, the ship was found seaworthy and resumed its voyage northward.

The ATSB released its report on *Doric Chariot* on 25 September 2003. The report concluded that the pilot had fallen asleep in an inappropriate area of the passage. It also concluded that:

- the pilot's instruction as to where he should be called was too close to approaching danger for any corrective action to be taken
- the pilot was likely to have been experiencing a significant level of fatigue
- the officer of the watch did not maintain an effective visual watch and permitted the ship to stray from the intended course.

The ATSB report recommended that:

- ships' officers should ensure that they understand instructions from pilots before accepting conduct of a vessel from them. Additionally, pilots must ensure that they are satisfied that ships' officers fully understand pilots' intentions
- the Great Barrier Reef pilotage services should consider adopting a fatigue management policy to predict potential fatigue levels at key positions in the pilotage passage.

The report's recommendations are detailed at Appendix 4.

Star Sea Bridge/Sue M

At about 0110 on 21 June 2000, off Evans Head, NSW, the skipper of the Australian prawn trawler *Sue M* and the deckhand were sorting their catch on the afterdeck. The trawler, on autopilot, was heading east to a fishing ground when it was struck on its port side by a southbound ship. The skipper ran into the wheelhouse to attempt to take control of the trawler as it rolled over to starboard and capsized.

The deckhand jumped clear of the trawler before it sank. He climbed into the trawler's fibreglass dinghy and was rescued the next night by another trawler.

The ship that had collided with the trawler was the Panama flag bulk carrier *Star Sea Bridge*, bound for Melbourne from Brisbane. The bulk carrier had been manoeuvring to avoid a northbound container ship and, as it was resuming its course, the second mate saw a white light close by to starboard. Despite ordering full port rudder, the ship made contact with the white light. The master was called to the bridge and, after searching and finding nothing, he ordered the passage to Melbourne resumed.

At Melbourne the ship was boarded by agents of the Australian Federal Police who initiated an investigation and, subsequently, criminal proceedings against the master and the second mate. The ATSB conducted a separate safety investigation.

An extensive air and sea search was unable to locate the skipper of Sue M. The wreck of *Sue M* was located and divers recovered the body of the skipper from the wheelhouse.

The ATSB report on the collision concluded that:

- the fishing vessel *Sue M* sank, with the loss of its skipper, after colliding with the bulk carrier *Star Sea Bridge*

- the second mate and lookout of the ship were not keeping a proper lookout
- the skipper and deckhand of the fishing vessel were working under bright deck lights and were not keeping a proper lookout.

The report recommended that;

- ships' masters and skippers of fishing vessels should ensure that a proper lookout is maintained at all times
- ships' masters, watchkeepers, fishing vessel skippers and crews take note of the limitations of radar
- owners, operators and skippers of fishing vessels consider the use of appropriate equipment to improve the radar detectability of their vessels.

The report's recommendations are listed at Appendix 4.

A list of all 17 reports released is at Appendix 3.

Participation in marine safety forums

Marine Accident Investigators' International Forum (MAIIF)

Australia is the current chair of the Marine Accident Investigators' International Forum (MAIIF), established in Canada in 1992. The twelfth meeting of MAIIF was held in Vina del Mar, Chile, from 3–7 November 2003. Forty four delegates representing 27 countries attended the meeting.

Opening the meeting, the Director General of the Maritime Territory and Merchant Marine of Chile confirmed his country's support for MAIIF as an international forum, noting that it was essential for marine authorities to share information, experience and knowledge to improve safety at sea.

The agenda included national and regional activity in marine casualty investigation, electronic evidence and technical innovation, human factors in accidents and incidents, investigator training, fishing vessel safety and the ISM (International Safety Management) Code.

Papers presented dealt with a number of issues, including:

- the difficulties experienced with the lack of a standard system for obtaining information from voyage data recorders

- a tanker explosion highlighting deficiencies in the ship's safety management system (SMS) and in the ISM audits of that SMS
- analysis of a near collision using radar and voice recordings from a port's vessel traffic system
- small boat safety and a proposal for a safety management system for fishing vessels
- the grounding of a cruise liner and an analysis of its damage stability.

The Australian presentation provided the delegates with an overview of the ATSB's enhanced marine database, MIASIS.

Flag State Implementation Sub-Committee

The ATSB participated at the twelfth meeting of the IMO Flag State Implementation (FSI) Sub-Committee (London, 15–19 March 2004) and formed part of the Working Group on Casualty Analysis and Statistics. Delegates represented 72 member governments, along with Hong Kong as an associate member of IMO, an observer from the European Commission and observers with consultative status from 15 non-government organisations.

In the opening address, the Secretary-General emphasised the importance of the work of the Sub-Committee and the Casualty Analysis Group in the light of recent significant casualties. He specifically mentioned ISM Code matters with reference to a paper submitted by Australia dealing with ISM-related issues arising from ATSB investigations.

The ATSB's role at FSI 12 centred on:

- casualty analysis and remaining an active member of the Correspondence and Working Groups
- analysis and recommendations relating to IMO's casualty database via the Correspondence Group
- amending circulars relating to casualty reporting
- proposing amendments to SOLAS I/21 via the Correspondence Group
- bringing deficiencies in the application of the ISM Code to the attention of the Sub-Committee for further action.

Maritime conferences, courses and training

During 2003–04, officers from the ATSB's marine investigation unit attended the Natship 2004 conference in Sydney, a GPS conference in Melbourne, an NMSC (National Marine Safety Committee) Marine Safety Conference 2003 in Sydney and a conference on Escape, Evacuation and Recovery in London.

Members of the unit attended ICASS 2003 (International Confidential Aviation Safety Systems conference) in Canberra and, later, explained the ATSB's Confidential Marine Reporting Scheme and associated regulations to Shipping Australia, shipowners associations, maritime unions and other organisations that would participate in or provide assistance to the scheme.

Investigators attended a Bridge Resource Management course in Sydney, a course on the Fundamentals of Investigation in the UK and an Australian marine pilots competency audit in Malaysia. The ATSB also presented the keynote paper and a paper on risk management at the Australian Marine Pilot's Association workshop in Fremantle in March 2004.

The unit conducted a two week IMO model training course for marine investigators in Malaysia. ATSB also continued its support of Advanced Marine Pilots and made presentations on human factors at the various courses.

Presentations

During the year, members of the marine unit presented papers at:

- a Royal Australian Navy training course for marine investigations
- an AMSA seminar on Human Factors
- meetings on the CMRS in Sydney
- AMSA surveyors' workshops in Sydney and Melbourne
- a Marine Safety Victoria joint agency workshop in Melbourne with the Victorian Police and the Victorian Coroner.

Aviation

Role

As Australia's prime air safety investigation agency, the ATSB investigates accidents, incidents and safety deficiencies involving civil aircraft in Australia. It does so in accordance with Annex 13 to

the Convention on International Civil Aviation (Chicago Convention 1944), which has legal force through Part 2A of the *Air Navigation Act 1920* for accidents that occurred before 30 June 2003 and through the *Transport Safety Investigation Act 2003* (TSI Act) for aviation occurrences occurring after 1 July 2003.

From 1 July 2003 all air transport safety matters as listed in section 23 of the *Transport Safety Investigation Act 2003* (formerly aircraft accidents, incidents and safety deficiencies as defined in Part 2A of the *Air Navigation Act 1920*) that occur in Australia must be reported to the ATSB. The Bureau then decides if it will investigate. Investigating selectively allows the Bureau to more thoroughly analyse those occurrences it believes will yield the most useful safety benefits within the budget available after meeting international obligations and community expectations with respect to fatal accidents. The ATSB may also assist in investigations of accidents and serious incidents involving Australian-registered aircraft overseas.

As with similar bodies worldwide, ATSB recommendations are not mandatory as this would make the investigator a de facto regulator.

The ATSB publicises its aviation safety results through:

- aircraft accident/incident reports
- aviation safety research reports
- safety recommendations and advisory notices and information circulars
- articles in magazines such as CASA's *Flight Safety Australia*
- participation in safety conferences and forums.

International recognition for aviation investigation

The ATSB received international recognition for outstanding work in its *Investigation into Ansett Australia maintenance safety deficiencies and the control of continuing airworthiness of Class A aircraft report*. In November 2003, the prestigious Flight Safety Foundation 2003 Cecil A. Brownlow Publication Award went to the ATSB for 'extraordinary efforts in identifying, investigating and reporting on a systemic problem affecting aviation safety worldwide'.

The ATSB's Executive Director accepted the award at the joint meeting of the Flight Safety Foundation, the International

Federation of Airworthiness and the International Air Transport Association in Washington DC. The ATSB's report, released in November 2002, highlighted that a robust system for regular inspection and maintenance of Boeing 767 aircraft was essential to assure continuing airworthiness.

The Cecil A. Brownlow Publication Award recognises publications, articles, electronic media or individuals with demonstrated excellence and commitment in their coverage of aviation safety topics. Submissions are judged on the quality of writing and research, the presentation and, importantly, the contribution to safety awareness.

Key safety activities and results

In 2003–04, the ATSB received 4556 notifications of accidents and incidents and commenced 75 new occurrence investigations. This was in excess of the planned 60 target in anticipation of additional Budget funding from 2004–05. The ATSB also released 63 final occurrence and technical investigation reports, which are available on the ATSB website and are listed at Appendix 3.

Major investigation reports released included:

- a serious incident involving a Saab 340 aircraft icing and stalling near Bathurst
- a serious close proximity incident involving an airprox threat to aircraft safety near Launceston on Christmas Eve 2003
- a midair collision at Moorabbin airport
- a midair collision near Bankstown airport
- a fatal accident at Hamilton Island shortly after take-off
- a fatal accident at Toowoomba shortly after take-off
- a fatal crash of an IL76 cargo jet aircraft near Baucau, East Timor.

At the beginning of 2004–05 the ATSB continued to investigate 76 occurrences and technical safety matters including:

- VH-WAC Piper PA-23-250 fatal accident near Mareeba
- VH-OHA Robinson R22 helicopter fatal accident near Camden
- VH-UXF Robinson R22 helicopter fatal accident near Derby

- VH-YKL Robinson R44 helicopter fatal accident north west of Kununurra
- VH-TUR Cessna 172M fatal accident near Wedderburn south west of Sydney
- VH-HTD Bell 407 helicopter fatal accident north of Mackay
- VH-TRZ Piper Cherokee fatal accident near Lake Eildon
- VH-CTT Piper PA-34-200 fatal accident at Bankstown aerodrome
- VH-LST Aero Commander 500-S fatal accident north west of Hobart
- VH-JWX Beechcraft BE76 fatal accident at Camden aerodrome
- VH-ANV Cessna 404 fatal accident at Jandakot Aerodrome
- A major technical study of a range of failures in high-powered reciprocating engines.

A full list of ATSB air investigations underway at the beginning of 2004–05 is at Appendix 5.

The ATSB issued 46 aviation recommendations during 2003–04 which addressed important issues including:

- Robinson main rotor blade root fittings and the integrity of the adhesive bond in the spar to root fitting joint
- Robinson R22 and R44 clutch shaft and shaft to yoke attachment bolt holes with regard to evidence of fretting, cracking or other wear
- personal protective equipment and fire bucket standards for water-bombing in support of fire fighting operations
- reviewing NAS Class E airspace procedures emphasising climb and descent in non-radar airspace including education, training and chart frequency material
- Saab 340 aircraft stall warning systems for icing conditions and abnormal and emergency check lists
- the risk management process for reduced Moorabbin airport air traffic control tower hours of operation
- the overall collision risk at major general aviation airports and advisory material for pilots about collision risk management strategies

- safety benefits of introduction of a drug and alcohol testing program to the aviation industry for safety-sensitive personnel
- maintenance control, engine trend monitoring and compliance with mandatory requirements; CASA oversight of the operator, and Toowoomba airport runway configuration requirements
- to avoid controlled flight into terrain, better use of available technology and equipment, implementing standard operating procedures, and improving collegiate crew decision-making, risk assessment and management.

A full list of the ATSB's aviation recommendations is at Appendix 4.

Occurrence investigations

Occurrences reported since 1996–97 under Part 2A of the Air Navigation Act 1920 and since 1 July 2003 under the TSI Act show an increase from 3962 reported in 1996–97 to 4556 occurrences reported to the ATSB in 2003–04 (see table 20) down from a 2000–01 peak of 6133. An increase may be the result of an improving safety reporting culture rather than any worsening of safety. The decline in 1999–00 may be partly the result of the avgas fuel contamination that grounded thousands of small aircraft in late 1999 and early 2000. The decline from 2000–01 is due in part to a decline in tourism and aviation activity as a result of the effects of the terrorist attacks in the USA on 11 September 2001 and in Bali, Indonesia on 12 October 2002; the cessation of Ansett's operations; and the spread of the SARS virus.

The decline in 2003–04 compared with 2002–03 is mainly the result of different reporting and occurrence classification requirements from 1 July 2003 under the Transport Safety Investigation Act and Regulations.

Table 20:
Accidents & incidents notified to the ATSB, 1996–97 to 2003–04

Occ Type	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Accident	251	244	226	203	215	179	151	152
Incident	3710	3985	5686	5274	5918	5468	5797	4404
Total	3961	4229	5912	5477	6133	5647	5948	4556

Note: *Incident includes Serious Incident; Occurrences 'notified' are those assessed by the ATSB to meet accident and incident definitions for the purpose of entry to the OASIS database.*

Key air safety investigation reports published during 2003–04

Hamilton Island fatal accident investigation

At about 1708 Eastern Standard Time (EST) on 26 September 2002, a Piper PA-32-300 (Cherokee Six) aircraft, registered VH-MAR, crashed shortly after takeoff from runway 14 at Hamilton Island, Queensland. The charter flight was to Lindeman Island, a distance of about 15 km to the southeast. The pilot and five passengers were fatally injured. A severe post-impact fire consumed the majority of the fuselage.

The ATSB investigation report released in March 2004 found that the aircraft's engine began operating abnormally soon after take-off, the pilot initiated a steepening right turn at low level, and the aircraft stalled at a height from which the pilot was unable to effect recovery.

The pilot was qualified, appropriately endorsed and authorised for the operation, and his condition and demeanour on the day of the occurrence were reported to be normal. There was no evidence that fuel contamination, amount of fuel carried, structural failure or meteorological conditions were factors in the occurrence. The reason for the engine's abnormal operation could not be determined.

Post-mortem toxicological examination of the pilot's blood revealed a blood alcohol concentration (BAC) of 0.081 per cent, the presence of an inactive metabolite of cannabis, and an analgesic preparation consistent with a therapeutic dosage. The possibility that the pilot's BAC reading resulted at least in part from post-mortem alcohol production could not be discounted.

There was insufficient evidence to definitively link the pilot's prior intake of alcohol and/or cannabis with the occurrence. However, the adverse effects on pilot performance of post-alcohol impairment, recent cannabis use and fatigue could not be discounted as contributory factors to the occurrence. In particular, the possibility that the pilot experienced some degree of spatial disorientation during the turn as a combined result of the manoeuvre, associated head movements and alcohol-induced balance dysfunction could not be discounted.

The operator initiated a number of safety actions in order to mitigate some of the issues identified in the report. Those actions include the areas of: company pilot training, fatigue management, documentation, and aircraft operations.

The ATSB issued four recommendations concurrent with the release of this report. The first three recommendations address the potential use of alcohol and drugs by safety-sensitive personnel in the Australian aviation industry, and options to manage the safety risk to the travelling public of that potential use. The fourth recommendation addresses the CASA Air Operator Certificate Safety Trend Indicator surveillance methodology. In addition, two Safety Advisory Notices have been issued to CASA relating to pilot manipulation of the Cherokee Six fuel selector and development by operators of pilot induction training programs.

In the interests of future safety the ATSB also released aviation research discussion papers on *Alcohol and Human Performance from a Aviation Perspective-A Review* and *Cannabis and its Effects on the Pilot*.

In May 2004, the Minister of Transport and Regional Services approved Terms of Reference for CASA and the Department of Transport and Regional Services to jointly conduct a review of the safety benefits of introducing a drug and alcohol testing programme for safety-sensitive personnel in the Australian aviation industry. The joint CASA/Departmental review team invited submissions from industry and the wider community by 30 June 2004 and is expected to report to the Minister later in 2004.

Bankstown midair collision report

At approximately 3:25 PM on Sunday 5 May 2002, a Piper PA28-161 Warrior aircraft, registered VH-IBK and a Socata TB-9 Taralga aircraft, registered VH-JTV, collided while approaching to land at Bankstown airport.

The ATSB investigation report, released in May 2004, found that the midair collision was the result of the Piper passing through the extended centreline of runway 29 centre, to which the pilot had been cleared, and continuing on to the extended centreline of runway 29 left. The Piper collided with the Socata, which had been cleared for its final approach to the left runway. The Piper became uncontrollable, crashed in an industrial area to the south-east of the airport, and all four occupants were fatally injured. The Socata landed at Bankstown and the two occupants were uninjured.

At the time of the accident, General Aviation Airport Procedures (GAAP) were in operation under which pilots operating in visual meteorological conditions were responsible for aircraft separation when airborne in the circuit. Air traffic controllers were responsible for issuing sequencing instructions and providing traffic

information to assist pilots to avoid other traffic. The pilot of the Piper was issued traffic information on the Socata and the pilots of the Socata reported that they saw the Piper.

A number of aircraft were conducting training circuits on runway 29 left (via left circuits) and other aircraft were arriving and departing Bankstown on runway 29 right (via right circuits). The pilot of the Piper had requested, and been issued with, a clearance to land on runway 29 centre from a right circuit and the pilots of the Socata had been issued with a clearance to conduct a touch and go landing on runway 29 left from a left circuit.

A proportion of GAAP operations at Bankstown involved contra-circuits onto runways 29 left and 29 centre, which were 107 m apart. Contra-circuit operations to runways less than 213 m apart were permitted, provided that the air traffic controllers issued traffic information to pilots about aircraft in the opposite circuit.

The investigation concluded that there were insufficient visual cues for a pilot in one circuit to reliably assess the collision potential of an aircraft in the opposing circuit, when both aircraft were conducting contra-circuits to parallel runways 107 m apart.

In December 2003, Airservices Australia modified its procedures for Bankstown so that, where aircraft involved in contra-circuits are likely to be at base or final legs at approximately the same time, the use of the centre runway would be denied.

The ATSB report included recommendations to Airservices Australia and CASA regarding the estimation of overall midair collision risk at major General Aviation airports, and the provision of advisory material for pilots about collision risk management strategies. The ATSB is monitoring the responses to these recommendations.

Toowoomba fatal accident shortly after takeoff

At about 0836 Eastern Standard Time on 27 November 2001, a Raytheon Beech C90 King Air aircraft, registered VH-LQH, with a pilot and three passengers on-board, took off from runway 29 at Toowoomba aerodrome for an Instrument Flight Rules charter flight to Goondiwindi. As the aircraft became airborne, it lost power on the left engine. Following take-off, the landing gear was not retracted. Control of the aircraft was lost and it struck powerlines before impacting the ground inverted, in a steep nose-down attitude. An intense fuel-fed fire erupted upon initial impact with

the ground and all four occupants were fatally injured. At impact the left propeller was not feathered and the right engine was developing significant power.

There was no evidence that fuel contamination, a birdstrike, airframe structural failure, incorrect aircraft loading or meteorological conditions were factors in the occurrence.

Examination of the left engine showed internal damage consistent with the fracture and release of one or more compressor turbine blades, resulting in a significant reduction in power from the engine. Engine Condition Trend Monitoring (ECTM) Program data from the left engine indicated that a potentially safety-critical problem existed in that engine for several weeks prior to the accident. For a variety of reasons that evidence was not detected. The pattern of evidence suggests that temperature-related damage to the left engine's compressor turbine blades, probably due to a problem with the efficiency of the cold section of the engine, resulted in the failure of one of the blades.

As part of maintenance arrangements prior to the accident, the operator had been sending the ECTM data to the engine manufacturer's field representative for analysis, but it was not being recorded or submitted for analysis as frequently as required by the engine manufacturer, or CASA's Airworthiness Directive AD/ENG/5 and there were deficiencies in the operator's maintenance scheduling processes. AD/ENG/5 enabled time between overhaul extensions under less restrictive circumstances compared with those required by the manufacturer, but CASA's surveillance system was not sufficiently rigorous to ensure that the mitigators it had introduced were effective. The investigation also found that the CASA system for approving maintenance organisations and maintenance controllers did not appropriately consider the maintenance organisation's resource requirements.

The engine failure occurred during a critical phase of flight, just prior to, or at about, the time of take-off. Takeoff speed when the aircraft became airborne was probably close to minimum control speed (Vmca) of 90 kts, not sufficient to allow the aircraft to accelerate to the best one-engine inoperative rate of climb speed (Vyse) of 107 kts with an engine failure. With an engine failure or malfunction near Vmca, the safest course of action would be to reject the takeoff. This means that the aircraft may overrun the runway and perhaps sustain substantial damage, but the

consequences associated with such an accident will generally be less serious than a loss of control after becoming airborne.

The operator's procedures did not provide appropriate guidance for pilots regarding decision speeds or decision points for use for an engine failure during takeoff. Aircraft manufacturers have provided such material, but CASA has not published formal guidance material. Further, the level of training available for emergencies in this category of aircraft during critical phases of flight and at high aircraft weights is less than desirable.

The runway length, and the visual appearance of the runway and buildings beyond the runway at the time of the engine failure may also have influenced the pilot's decision to continue with the takeoff. Toowoomba aerodrome was licensed and met the relevant CASA standards. However, runway 29 did not meet the ICAO standards in relation to the runway end safety area (RESA).

The ATSB investigation report into the Ilyushin 76TD cargo jet crash in East Timor is featured in the international cooperation section below.

ATSB air safety recommendations released during 2003–04

The ATSB has a strong preference to report remedial safety action undertaken in its final reports if this is possible, to avoid the need to make recommendations. However, some recommendations remain necessary, especially when there are international safety implications.

In 2003–04 the ATSB created 30 safety deficiency notices and issued 46 recommendations and two safety advisory notices.

The ATSB air safety recommendations arising from the investigations into Hamilton Island, Bankstown, Toowoomba, East Timor and other occurrences are detailed in Appendix 4. Full details of air safety recommendations and responses are listed on the ATSB website at www.atsb.gov.au.

Other key 2003–04 ATSB air safety recommendations included:

VH-OLM (Hazleton) Saab 340 Loss Of Control Serious Incident near Bathurst 28 June 2002 - Stalling in icy conditions (R20030179-183)

R20030179-81

- The Australian Transport Safety Bureau recommends that Regional Express, Hazelton Airlines and Macair note the

circumstances of the above incident where Saab 340 aircraft can stall without warning in icing conditions and alert their flight crew accordingly.

Response summary

Representatives of Regional Express Airlines and Macair attended the May 2004 forum with Saab to discuss safety issues regarding Saab 340 aircraft stalling in icy conditions. The ATSB has not yet received responses from these airlines to recommendations R200300179-81.

R20030182

- The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority examine the circumstances surrounding this incident where Saab 340 aircraft can stall without warning in icing conditions and take appropriate action to ensure the safety of the Saab 340 fleet operating within Australia.

Response summary

CASA advised the ATSB on 25 February 2004 that it would observe any developments by the aircraft manufacturer or other aviation regulatory authorities towards mandatory modification of Saab 340 aircraft to provide enhanced stall warning in icing conditions. The Authority understands that Transport Canada requires enhanced stall warning in Saab 340 aircraft registered in Canada. However, CASA is not aware of any Service Bulletin or similar document offering this enhanced stall warning system for general availability.

CASA is satisfied that both Rex and Hazelton have taken appropriate measures to address the deficiencies identified in the 'Local Safety Actions' at Section 4.2 of the ATSB Report on the VH-OLM serious incident. In addition, CASA plans to publish a series of articles on icing related issues in a future edition of *Flight Safety Australia*.

R20030183

- The Australian Transport Safety Bureau recommends that, as a matter of priority, Saab Aircraft AB modify the stall warning system of the worldwide fleet of Saab 340 aircraft to give sufficient warning of an impending stall to crews during flight in icing conditions.

Response summary

Saab AB responded to the ATSB recommendation on 27 March 2004 advising that they foresaw the need to increase flight crew awareness of flying in icing conditions, and thereby reducing the risk of similar

incidents in the future. They envisaged working closely with the ATSB, the Swedish Accident Investigation Board (SHK) and the Swedish Civil Aviation Board on the issue.

The Saab AB response also suggested the series of meetings that were subsequently held between Saab AB, CASA, the Australian operators of the aircraft type and the ATSB in May 2004. The meetings discussed the certification procedures for flight in icing conditions, the ATSB investigation report, the training of operators and crew, and the Australian experience of local weather conditions such as icing conditions applicable to this incident.

Saab undertook to review the issues surrounding this and other Saab 340 aircraft icing incidents. The operators also undertook to review their procedures relating to flight in icing conditions.

VH-OHA Robinson R22 fatal helicopter crash near Camden NSW 20 June 2003 - Robinson R22 main rotor blades (R20030186)

- The Australian Transport Safety Bureau recommends that the United States Federal Aviation Administration (US FAA), in conjunction with the manufacturer of the helicopter, the Robinson Helicopter Company, conduct a review of a representative sample of main rotor blade root fittings to establish the integrity of the adhesive bond in the spar to root fitting joint. The review should establish the extent of the loss of adhesion and the extent to which corrosion has infiltrated in the region of the inboard bolt hole of the blade root fitting. If possible, where disbonding is discovered, the operating history and in-service flight spectrum of the helicopter and the environmental conditions under which it operated should also be assessed. When completed, the results of the review should be forwarded to the ATSB for analysis as part of the ongoing accident investigation.

Response summary

The US FAA responded to Recommendation R20030186 on 8 March 2004, and the ATSB wrote back on 16 March 2004 asking them to review their response to ATSB, as safety critical aspects were not addressed.

The US FAA issued an Emergency Airworthiness Directive on 18 March 2004 to operators and owners of R22 helicopters worldwide, which reduced the Calendar life of the main rotor blades. On 22 March 2004, CASA issued amendment 10 to AD/R22/31 in response to the FAA Airworthiness Directive.

VH-UXF Robinson R22 helicopter crash near Derby WA 28 September 2003 - Robinson clutch shafts and yoke assemblies. (R20030211, R20030212)

R20030211 and R20030212

- The Australian Transport Safety Bureau recommends that: Helimuster (NT) (R20030211) carry out an inspection of the company R22 fleet and the company R44 fleet; and that CASA (R20030212) mandate a one-off inspection of the Australian R22 fleet and if considered necessary, the R44 fleet, to:

  a) inspect the A166 clutch shaft for evidence of fretting where it mates with the A907 yoke, and;

  b) inspect the shaft to yoke attachment bolt holes for fretting cracking or other wear, and;

  c) identify and remove paint from beneath the yoke assembly bearing block plate, and;

  d) identify and remove from service any instances of a non-approved mating compound on the A166 shaft to A907 yoke for the R22 fleet and the C166 shaft to C908 yoke for the R44 fleet.

Response summary

In response to the release of Recommendation R20030211, CASA advised that it had issued two Airworthiness Directives in response to the matters raised by the ATSB. The Airworthiness Directives require the inspection of the main rotor yoke and clutch shaft joint for evidence of fretting, cracking, paint and the use of a non-approved jointing compound. If the inspection shows any of these signs, the yoke and shaft must then undergo a magnetic particle inspection procedure before being re-installed in the aircraft. Airworthiness Directive AD/R22/51 became effective on 12 November 2003 and AD/R44/51 became effective on 3 December 2003.

Boeing Co 737-700/S.O.C.A.T.A. Groupe Aerospatiale. Close proximity incident near Launceston 24 December 2003 - National Airspace System (NAS) procedures (R20040013, R20040014)

The ATSB recommends that:

R20040013

- the Civil Aviation Safety Authority, in consultation with Airservices Australia and the NAS Implementation Group, review NAS procedures and communications requirements for

operations in Class E airspace, with particular emphasis on air transport operations during climb and descent in non-radar airspace, with a view to enhancing situational awareness of pilots operating in that airspace. The review should include examination of, and where necessary revision and updating of, education, training and chart frequency material.

Response summary

CASA agrees with recommendation. R20040013. CASA stated that a review of Stage 2b of the NAS had commenced and the Authority is obtaining and analysing information from all stakeholders. CASA has additionally been meeting with both Airservices Australia and the National Airspace System Implementation Group on this matter and undertook to advise the ATSB of any outcomes as this matter progressed.

R20040014

- Airservices Australia, in consultation with the Civil Aviation Safety Authority and the NAS Implementation Group, review NAS procedures and communications requirements for operations in Class E airspace, with particular emphasis on air transport operations during climb and descent in non-radar airspace, with a view to enhancing situational awareness of pilots operating in that airspace. The review should include examination of, and where necessary revision and updating of, education, training and chart frequency material.

Response summary

Airservices Australia advised ATSB on Recommendation R20040014 that they had conducted a review of all of the issues related to the Launceston incident including those issues specifically sighted in the ATSB recommendation. Available information including on pilots failing to comply with the new changes or violating controlled airspace showed that pilot education and training had not been as effective as it was expected to be. Airservices stated that the ATSB Report also highlighted a possible misunderstanding by pilots of the intent of the pilot education and training.

Airservices proposed strategies to address the issues concerning pilot education and training including that CASA conduct a quality assurance assessment of the pilot training and education as well as pilot comprehension of the material; and that further pilot

education be developed with emphasis on use of radio frequencies, radio contact, use of transponders, and pilot responsibility.

Airservices also advised that their review of incident data and the ATSB Report also raised an issue of pilot situational awareness, especially within Class E airspace. Transponder non-usage and/or unserviceability had also been a noticeable trend and can be associated with the situational awareness issue. Immediate strategies that address this issue will be implemented as soon as practicable with consultation and agreement, where necessary, with the relevant agencies.

Investigation backlog

In 2003–04, the ATSB released 63 aviation investigation and technical reports with a median time from occurrence date to report release of 347 days which was up from the 2002–03 figure of 279 days partly as a result of the finalisation of the Toowoomba investigation report and resource constraints. The number of uncompleted investigation reports increased slightly from 66 at the end of 2002–03 to 76 at 30 June 2004. The number of investigations more than 12 months old increased slightly from 14 to 15.

Confidential Aviation Incident Reporting

The Confidential Aviation Incident Reporting (CAIR) programme was established in 1988 and ceased to operate in February 2004 when the Government initiative of an Aviation Self Reporting Scheme (ASRS) was introduced. CAIR began as a voluntary confidential incident self-reporting scheme without a legislative basis. Over time, increasing numbers of reports concerned third parties and the lack of legislative protection increased associated risk. The decision to discontinue CAIR was made prior to the Government's announcement of additional ATSB funding in the May 2004 Budget. In 2003–04 until it ceased operation in February 2004, CAIR issued 138 'For Your Information' notices and no Alert Bulletins.

Table 21:
CAIR reporting to the ATSB 1997–98 to 2003–04

Occ Type	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
CAIR	287	326	295	357	321	257	138

Aviation Self Reporting Scheme

Following an amendment to the *Civil Aviation Act 1988* and associated regulations, a new voluntary and confidential aviation reporting system entitled the Aviation Self Reporting Scheme (ASRS) commenced operation on 21 February 2004. The former CAIR resources were redirected within the ATSB to the new ASRS.

To be eligible for acceptance under ASRS, the report must be about the reporter's own contravention. The report must be submitted to the ATSB, in writing, no later than 10 days following the contravention. In addition to providing protection from administrative action, the reports, while protecting the reporter's identity, may also be used to:

- strengthen the foundation of aviation human factors safety research
- identify deficiencies and problems in the Australian aviation safety system
- provide data for planning and improvement to the Australian aviation safety system.

A report by the holder of a civil aviation authorisation under the ASRS does not satisfy the reporting obligations under the *Transport Safety Investigation Act 2003* for Immediately or Routine Reportable Matters. These reports of accidents and incidents must be made to the Executive Director of Transport Safety Investigation through the ATSB's mandatory open reporting scheme.

For inquiries contact the ASRS manager on 1800 020 505 or asrs@atsb.gov.au.

The Management of Enforcement and Investigations may be contacted at CASA on 131 757 for specific inquiries related to claiming immunity.

From 21 February to 30 June 2004 the ATSB processed six reports through the Aviation Self Reporting Scheme.

Safety promotion

Along with CASA, the ATSB provides safety information to the aviation industry. The Bureau promotes aviation safety by:

- publishing investigation reports and safety studies
- publishing safety recommendations and notices

- providing information on its website
- delivering presentations at conferences and safety forums
- cooperating internationally
- contributing to Parliamentary inquiries
- participating in coronial inquests
- publishing the ATSB Supplement in CASA's *Flight Safety Australia* (Appendix 1 lists articles published during 2003–04)
- maintaining safety programmes such as ASRS and INDICATE.

Presentations at conferences and safety forums

Effective safety systems depend on communication, a free exchange of information between safety professionals, and the ability to target those directly involved, including operators and managers.

To help spread the safety message, investigators spoke to:

- aero clubs and flying training schools
- helicopter operators
- aerial agriculture conferences
- regional airlines conferences
- air safety investigators conferences
- Australian Defence Force training days
- state government disaster management planning committees
- Airservices Australia training days
- flight safety and other industry forums
- tertiary institutions
- Aviation Industry Association New Zealand conferences.

Professional conferences addressed engineering, human factors, flight operations, air traffic control, cabin safety and flight recording issues.

In 2003–04, ATSB aviation staff attended:

- International Society of Air Safety Investigators Conference, Washington DC, August 2003

- Safeskies Conference, Canberra September 2003
- Emergency Management Conference, Melbourne, September 2003
- International Confidential Aviation Reporting Conference, Canberra, September 2003
- Kenyon International Symposium, Houston Texas, October 2003
- Flight Safety Foundation Seminar, Washington DC, November 2003
- Australian Aviation Psychology Symposium, Sydney, December 2003
- International Transportation Safety Association, Netherlands, March 2004
- 2004 Flightscape Users Conference, Ottawa, Canada, June 2004.

Ministerial directions and discontinued investigations

On 1 December 2003 the Minister for Transport and Regional Services signed an Instrument of Direction for the ATSB to investigate the effectiveness of Bankstown Airport fire fighting arrangements following the VH-CTT Piper PA-34-200 fatal accident at Bankstown aerodrome. The ATSB is continuing to investigate this issue.

During 2003–04 the ATSB discontinued five preliminary investigations and downgraded the incidents to category five occurrences. These incidents involved:

- a BAE 146 aircraft and tug vehicle at Sydney airport - evidence identified that a misunderstanding had occurred due to poor communications
- a Metroliner aircraft and a Bell 47 helicopter at Brisbane Airport the ATSB accepted Airservices' investigation of the circumstances of the occurrence
- a C172 aircraft disappeared off the Victorian Coast near Warrnambool Victorian Police evidence indicates that the disappearance was not due to an air safety occurrence

- two incidents featuring avionics smoke warnings - found to be spurious warnings attributed to dust disturbance that may have activated the smoke sensors.

Further details of these occurrences and reasons for discontinuance are set out on the ATSB website.

Inquests

The ATSB provided briefings to the NSW State Coroner in November 2003 in advance of inquests into the VH-NXC aircraft accident at Jerilderie, the Bankstown midair collision in May 2002, and the VH-OHA helicopter crash near Camden on 20 June 2002 which involved the structural failure of the main rotor blade.

ATSB investigators briefed the Queensland Coroner in May 2004 in advance of the inquest into the VH-WAC fatal aircraft accident near Mareeba in October 2003. The Queensland State Coroner also sought the attendance of an ATSB transport safety investigator with legal support at a Cairns inquest on 2-3 June 2004. The inquest concerned the VH-STL fatal aircraft accident near Horn Island, Queensland which occurred on 11 January 2002. The Coroner supported the findings of the ATSB investigation report.

Telephone evidence from a transport safety investigator was sought on Friday 2 July 2004 by a separate Queensland coronial hearing at Caboolture into the fatal VH-MTX helicopter accident on 19 March 2003. The inquest has not yet concluded and reopens on 15 October 2004. During July 2004 the ATSB also briefed the Victorian State Coroner on the VH-TRZ fatal aircraft accident that occurred at Lake Eildon in February 2004.

Involvement in international cooperation

As aviation is an international endeavour, aircraft accidents and incidents, regardless of location, are of direct interest to the global industry.

International Civil Aviation Organization (ICAO) standards and recommended practices in Annex 13 to the Chicago Convention apply to international and Australian civil aviation operations.

Unless a difference is filed with ICAO, investigations of aircraft accidents and serious incidents must comply with Annex 13 to the Convention on International Civil Aviation - the convention that gave birth to ICAO. Australia has incorporated the provisions of

Annex 13 into the *Transport Safety Investigation Act 2003*, and filed several differences.

ATSB is a corporate member of the international Flight Safety Foundation (FSF), one of the world's most influential private air safety organisations. The FSF has developed accident prevention programmes with ICAO, the International Air Transport Association and the US Federal Aviation Administration.

The ATSB is also a member of the International Transportation Safety Association (ITSA) and of the International Society of Air Safety Investigators (ISASI).

ATSB technical analysis expertise in materials failure analysis and flight recorder replay and analysis also assisted investigations in Indonesia, Papua New Guinea, New Zealand, Singapore, Bangladesh and East Timor.

Ilyushin 76 TD cargo jet aircraft crash investigation in East Timor

At the request of the East Timor Government, the ATSB completed an air safety investigation into a fatal aircraft accident involving a Lao-registered Iluyshin IL76 aircraft which crashed near Baucau, East Timor. The ATSB was supported by Australian Defence experts (DFS-ADF and DSTO) and by the Moscow-based IAC.

On 31 January 2003, at 0621 UTC (1521 local time), an Ilyushin 76TD (IL-76TD) aircraft, registered RDPL-34141, impacted terrain near Caicido village during a landing approach, about 1 NM (1.87 km) to the northwest of Cakung Airport, Baucau, Timor-Leste. The pilot in command was the handling pilot. The aircraft was destroyed by impact forces and a severe post-impact fire, and the six aircraft occupants were fatally injured.

At the time of the occurrence, there was low cloud near the aerodrome. Witnesses at the aerodrome estimated the cloud base to be about 1,000 ft (305 m) above ground level, and visibility to be about 1,500 m (0.8 NM).

The investigation determined that the flight crew's compliance with procedures was not at a level to ensure the safe operation of the aircraft, and that they did not conduct the instrument approach with reference to the Baucau non-directional beacon (NDB).

The flight crew used selected data from their instrument approach charts for Baucau to formulate a user-defined non-precision approach using the onboard global positioning system (GPS). That was a non-approved procedure. It deviated from normal practice,

bypassed all the safety criteria and risk treatments inbuilt into the design of the published non-precision approach procedures, and increased the risk of a controlled flight into terrain (CFIT) accident.

The occurrence highlights that deviations from recommended practice are a potential hazard, particularly during the approach and landing phase of flight, and increase the risk of a CFIT event. It also highlights that crew coordination is less than effective if crewmembers do not work together as an integrated team, and that support crewmembers have a duty and responsibility to ensure that the safety of a flight is not compromised by non-compliance with recommended practices.

ICAO audit of ATSB compliance with Annex 13 to the Chicago Convention

In May/June 2004 an ICAO team audited the ATSB's aviation accident and incident investigation activities to assess compliance with Chicago Convention Annex 13. The ICAO audit assessed the ATSB's ongoing performance including in:

- reporting occurrences and other relevant information to the States of Registry of the owner, operator, designer, manufacturer, and other relevant bodies.
- categorising accidents and serious incidents, and conducting professional independent investigations and issuing final reports.
- accident prevention measures, occurrence recommendations, databases, reporting systems.

ICAO is expected to provide an audit report to the ATSB later in 2004.

Aviation safety research

The ATSB's air safety research programme generated some significant research reports and research grants during the financial year. All reports are available on the ATSB website.

The *'General Aviation Fatal Accidents: How do they happen?* research paper confirmed that almost half of the general aviation fatal accidents between 1991 and 2000 were a result of an in-flight loss of control that mostly led to uncontrolled flight into terrain accidents or in some cases, in-flight break-ups. Controlled flight into terrain fatal accidents formed the next largest fatal accident type (30 per cent of fatal accidents) with wirestrikes being the prevalent accident type when aircraft were flying low.

The research paper also identified some interesting fatal accident risk factors. The risk of a fatal accident for private/business operations was almost double over the weekend than during the working week from Monday to Friday. The risk of a fatal accident was also significantly higher during the evening between 1700 and 2059 than at other times of the day. When pilot aeronautical experience was examined, it was found that the risk of a fatal accident only decreased significantly when a pilot had attained 1000 or more flying hours.

A paper on airspace-related occurrences involving regular public transport and charter aircraft in mandatory broadcast zones was updated in the light of useful feedback from industry and the public, and released as a final document.

Papers on the effects of cannabis and alcohol on pilot performance were released in conjunction with a report on an aviation safety investigation in which these issues may have played a part.

A review of ATSB occurrence data that could be used to assess the effect on safety of the airspace changes associated with the implementation of NAS 2b was published, with a supplementary paper published in July 2004.

A paper that reviewed midair collisions involving general aviation aircraft over a 42-year period was released in conjunction with an investigation report into a midair collision.

Two papers were released following a survey addressed to 5000 commercial pilots. One paper addressed safety climate across the aviation industry. The other paper addressed pilot perceptions of the commonest errors they encountered. Both sets of data were sorted into a number of categories.

A paper was released that reviewed light utility helicopter accidents, and the frequency of accidents sorted by aircraft type.

A paper on runway incursions was updated, and the data were further analysed to identify risk issues.

An aviation safety research grants programme was also initiated. Funding for research was advertised on the basis of competitive tender. A number of organisations are presently undertaking research under this programme. The grants are set out in Appendix 2.

Technical analysis

During 2003–04 ATSB technical analysis staff completed four technical analysis stand alone reports including:

- technical analysis of mast cable fractures in support of the NSW Coroner's investigation into a fatal microlight accident
- a stand alone study on the Fracture of Turbine Bolts conducted as a result of safety concerns raised by Air North. The report was completed in August 2003 and discussions with the engine manufacturer and maintenance agencies were completed in March 2004
- assistance to the Directorate of Flight Safety, Australian Defence Force (DFS-ADF) with the animation of an accident involving a Blackhawk helicopter near Amberley on 12 February 2004.

At the beginning of 2004–05 the ATSB continued seven technical analysis investigations including:

- a major ongoing technical analysis investigation relating to a range of failures in high-powered reciprocating engines
- a study titled Analysis of No. 4 Bearing Failures, CFM 56 engines which was initiated in response to a number of failures of No. 4 bearings over the past six years
- international assistance to the New Zealand Transport Accident Investigation Commission in the recovery and analysis of flight data recorder data and air traffic control audio and radar data relating to an accident involving a Convair 580, registered ZK-KFU, near Kapiti, New Zealand.

Communications and Information

The Communications and Information Unit plays a central role in helping the ATSB maintain and improve transport safety.

The Unit:

- coordinates public communication, briefing and media activities
- designs and publishes safety investigation and education materials
- provides information to stakeholders and the community
- manages the ATSB's website.

The Unit also has particular oversight of:

- the ATSB supplement in Flight Safety Australia
- media releases
- coordinating ATSB briefing on reports for the Minister and Department
- issues likely to provoke national media interest
- graphic standards and style
- materials in support of larger public communication events and launches
- Freedom of Information and legal issues.

Media

Wide public interest in the ATSB's activities and findings require a well-planned media response. The ATSB can be reached through its media contact officer or (24 hours, seven days a week) rostered duty officer.

Nominated staff received media training during the year to help them meet the requirements of their roles.

The Unit organised major media conferences with respect to the following high-profile aviation investigation reports:

- Bell 206B at Bendora Dam ACT
- Whyalla Airlines Supplementary investigation report
- Bankstown Airport fatal accident investigation report
- Hamilton Island fatal air accident report and associated research papers.

These conferences helped ensure that the extensive media coverage that followed was well informed and responsible. They also helped to publicise the ATSB's role in transport and aviation safety.

Website

The Communications and Information Unit develops and maintains the ATSB's website www.atsb.gov.au

Users can access information by selecting navigation links within each transport mode, or by searching directly for specific information using a customised search engine. The site contains:

- safety investigation and other reports
- research publications
- public education material (advice on child safety, drink driving, speeding, learner driving, fatigue, motorcycle safety and first aid).
- accident and incident statistics
- media alerts and releases
- speeches and 'audio grabs'
- online purchasing and downloads
- free 'subscription' information service
- safety-related articles of interest (backgrounders, fact sheets and discussion papers).

The site offers information produced or commissioned by the ATSB in easily searchable, accessible and downloadable formats. Users can request copies of road safety education material and teaching resources, or purchase online other ATSB safety information

products such as the *Ride On* motorcycle safety video and DVD, and the *Road Safety Research Library* (a 3-CD set).

The site's Accident and Incident Report form and Aviation Self Reporting Scheme (ASRS) form provide a secure online option for reporting air safety accidents and incidents and making other confidential reports. The site's free subscription information service announces new releases and developments to interested parties and industry stakeholders by means of an e-mail notification.

In 2003–04, the site attracted approximately seven million hits and by 30 June 2004 was averaging eight million hits. The number of hits increases markedly following the release of high-profile information or reports, particularly in aviation and road safety.

The ATSB provides required online information and services. The ATSB also supports the Government's Online Strategy objectives concerning Australian Government Locator Service metadata, accessibility for the disabled, and copyright and privacy concerns.

Information requests

During 2003–04, the Unit responded to more than 12,000 requests for safety information. Responses ranged from giving verbal advice on safety-related issues to distributing reports, statistical monographs and road safety public education materials.

The Unit also fielded media inquiries and promoted public awareness of the ATSB's safety resources.

The Unit updated and reprinted road safety resources as required: for example, the new *Ride on* DVD and the CD version of the World Health Day publication *Road Safety in Australia.*

Graphic design

The Unit's graphic design and publishing staff provide quality control of publications produced internally and externally. The ATSB website has benefited by way of high-quality design elements which have been incorporated into the general site design, and which form the visual basis for many reports and articles.

Freedom of information

The ATSB started 2003–04 with two Freedom of Information requests (FOIs) on hand and received 12 FOIs during the financial year. The Bureau completed seven FOIs, three within 30 days and

four between 30 and 61 days. Four FOIs were withdrawn. At 30 June 2004 three FOIs were on hand.

The Unit also responded to 14 subpoenas within specified timeframes set by the courts.

Court and AAT Hearings and Ombudsman

The ATSB was not involved in any 2003–04 hearings of Courts or the Administrative Appeals Tribunal (AAT), or with any applications to the Ombudsman.

Briefing Minutes for Ministers

The ATSB submitted 173 briefing Minutes to Ministers.

Ministerial correspondence

The ATSB helped draft 90 responses to letters for the Ministers.

Questions on Notice

During 2003–04 the ATSB drafted six responses to Questions on Notice, excluding the Senate Committee responses listed below.

Parliamentary Committees

In 2003–04 the ATSB appeared at three Senate Estimates Hearings of the Rural and Regional Affairs and Transport Legislation Committee:

- Supplementary Estimates in November 2003, after which the ATSB drafted answers to twenty three questions on notice
- Additional Estimates in February 2004, after which the ATSB drafted answers to five questions on notice.
- Budget Estimates in May 2004, after which the ATSB drafted answers to two questions on notice.

The ATSB also appeared at two other Committee Hearings:

- House of Representatives Neville Committee inquiry on road safety on 28 November 2003.
- Senate Committee inquiry on Whyalla Airlines on 1 December 2003.

During 2003–04 the ATSB also appeared at two state parliamentary hearings:

- The Parliament of Victoria Rural and Regional Services and Development Committee inquiry into the cause of fatality and injury on Victorian farms on 22 January 2004
- The Victorian Parliament Road Safety Committee inquiries into crashes involving roadside objects and into the country road toll on Wednesday 28 April 2004.

Transport safety performance statistics

Cross modal safety comparisons

Table 1 compares the relative risk of fatal injury to passengers using all major forms of land and air transport in Australia. Airline travel is by far the safest form. Bus and rail are the safest forms of land transport, while motorcycling is the least safe of all forms of transport.

Table 1:
Relative risk of fatal injury by Australian transport mode

Transport mode	Relative fatality rate based on passenger kilometres travelled (car travel = 1.0)
Aviation	
High-capacity RPT	0.0
Low-capacity RPT	0.2
Fixed-wing general aviation	5.7
Road	
Car	1.0
Bus	0.2
Motorcycle	28.0
Rail	0.2
Marine [1]	0.0

Source: *ATSB, ABS: using latest available data.*

(1) *Marine public transport via ferries.*

Multimodal trends (fatalities)

Table 2 shows the number of fatalities in each of the major transport modes over the last decade. Between 1993 and 2003, the most notable trend was a drop in road fatalities until 1997, after which they tended to remain relatively stable.

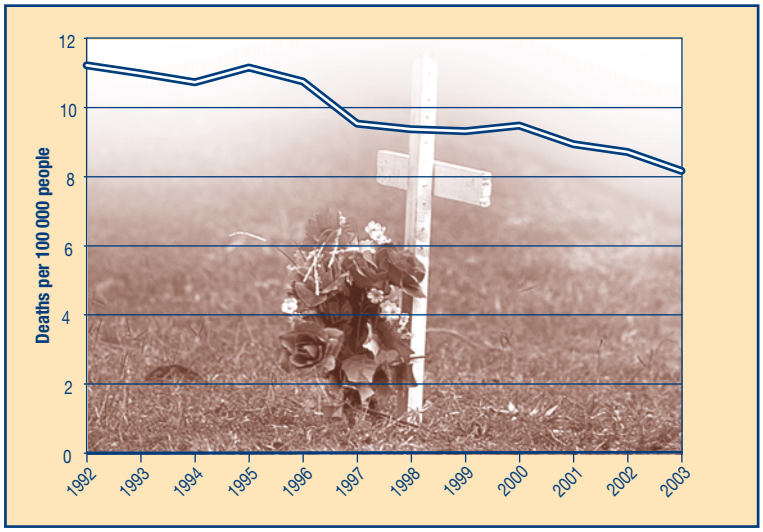
Table 2:
Australian transport fatalities by mode, calendar years 1993 to 2003

Year	Road	Rail	Marine	Aviation
1993	1953	52	69	53
1994	1928	43	58	51
1995	2017	46	55	39
1996	1970	30	60	43
1997	1767	43	46	28
1998	1755	43	46	46
1999	1764	41	51	40
2000	1817	38	42	37
2001	1737	34	56	41
2002	1715	30	38	23
2003	1625	..	..	34

Sources: *ATSB (road and aviation), Australian Bureau of Statistics (rail and marine).*
Note: *[..] Denotes data unavailable.*

The number of transport accident fatalities per 100 000 population decreased substantially during the period 1993 to 2002 (the latest ten-year period for which data are available), from 12.2 to 9.2 fatalities per 100 000 of population (Figure 1).

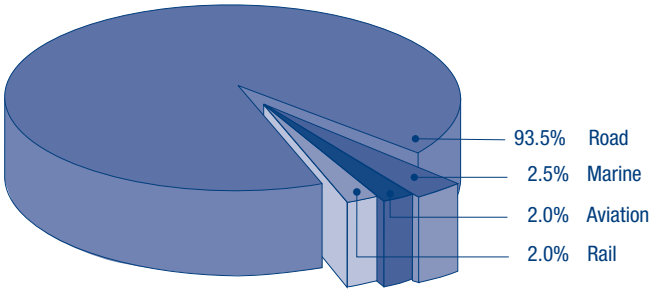
FIGURE 1:
Australian transport fatalities (all modes) per 100 000 population, calendar years 1992 to 2003



Source: Chart compiled by ATSB data sourced from ATSB and Australian Bureau of Statistics.

Figure 2 shows that road trauma is by far the largest contributor to transport fatalities. It accounted for 94 per cent of total transport fatalities in the five years from 1998 to 2002.

FIGURE 2:
Australian transport fatalities in the last five available years (1998 to 2002) by mode

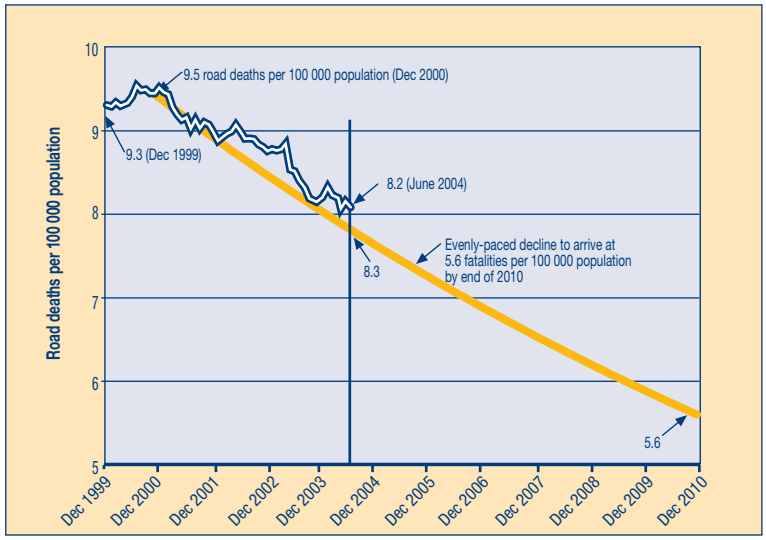


Source: ATSB (road and aviation). Australian Bureau of Statistics (rail and marine).

Road safety trends

The aim of the National Road Safety Strategy 2001–2010 (NRSS) is to reduce the road death rate by 40 per cent to no more than 5.6 road deaths per 100 000 population by 2010.

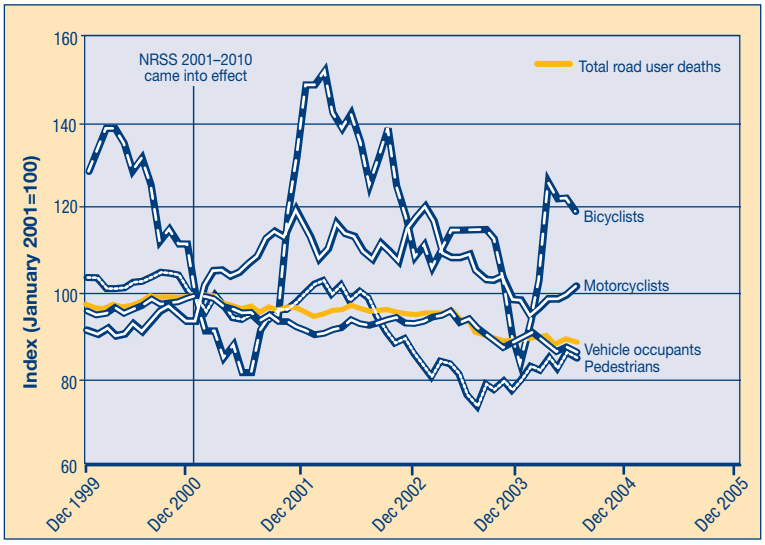
FIGURE 3:
Australian road death rates per 100 000 population, 2000–2004, including the NRSS 2010 projected target



Source: *ATSB*

The NRSS came into effect on 1 January 2001, at which time the annual road death rate for the preceding 12 months was 9.5 deaths per 100 000 population - a rate that was slightly above the 9.3 death rate that was used as a base for the NRSS. Figure 3 shows that by mid-2004 the Australian 12-month road death rate per 100 000 population stood at 8.2. On a straight line projection between the rate at 1 January 2001 and the target rate of 5.6 by the end of 2010, the projected rate for mid-2004 was 7.8 deaths per 100 000 population. The substantial challenge of meeting the target is evident.

FIGURE 4:
Australian road deaths by road user group, December 1999 to June 2004 (indexed at 1 January 2001)



Since the introduction of the NRSS, vehicle occupant and pedestrian deaths have decreased by 13 per cent and 14 per cent respectively. On the other hand, motorcyclist and bicyclist deaths have increased by 2 per cent and 19 per cent respectively.

Figure 4 gives a picture of road user deaths indexed from the point at which the 10-year NRSS came into effect; that is, road deaths for the 12 months preceding January 2001 are indexed at 100.

Table 3:
Persons seriously injured in road crashes, Australia, July 1999 to June 2002: road user group by period

Period	Drivers	Passengers	Pedestrians	Motorcyclists	Bicyclists	Other	Biannual Total
Jul-Dec 1999	3242	3071	1471	1895	1257	209	11145
Jan-Jun 2000	3297	2952	1395	2067	1384	144	11239
Jul-Dec 2000	3454	2939	1472	2001	1215	155	11236
Jan-Jun 2001	3230	2825	1328	2161	1198	151	10893
Jul-Dec 2001	3672	2994	1326	2187	1191	132	11502
Jan-Jun 2002	3414	2883	1260	2299	1303	114	11273

A National transport injury database has been established and a publication on Serious Injuries Due to Road Crashes is available in the road safety statistics section of the ATSB website. Table 3 details serious road crash injuries by road user group for July 1999 to June 2002. There is as yet insufficient data available to comment on serious injury trends.

Table 4:
Australian road deaths per 100 000 population, by state and territory, calendar years 1999 to 2003

Year	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
1999	9.0	8.2	9.0	10.1	11.8	11.2	25.4	6.1	9.3
2000	9.3	8.6	8.9	11.0	11.3	9.1	26.1	5.7	9.5
2001	8.0	9.2	8.9	10.1	8.7	12.9	25.3	5.0	8.9
2002	8.4	8.1	8.7	10.1	9.3	7.8	27.8	3.1	8.7
2003	8.1	6.7	8.2	10.3	9.2	8.6	26.7	3.4	8.2

Sources: *Calculated using ATSB road death data, and Australian Bureau of Statistics population data.*

Since the beginning of 2001, the road death rate per 100 000 population has decreased in all states and territories, with the exception of the Northern Territory. Overall, this has resulted in a decrease of 13 per cent. The major decrease in 2003 was in Victoria.

Truck safety trends

Table 5 shows the number of road deaths involving articulated trucks in each jurisdiction between 2000 and 2003. Data for heavy rigid trucks are not available but are estimated to be of the order of two-thirds of the road deaths involving articulated trucks.

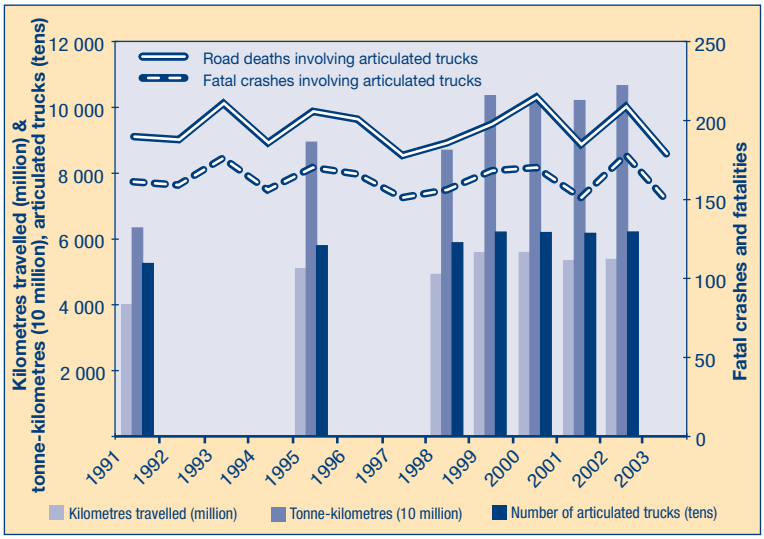
Table 5:
Australian road deaths involving articulated trucks, by state and territory, calendar years 2000 to 2003

Year	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
2000	84	40	40	19	13	6	6	0	208
2001	60	45	33	18	14	5	0	3	178
2002	86	49	28	13	14	3	7	0	200
2003	65	41	35	10	17	1	2	1	173

Source: *ATSB.*

Between 2000 and 2003, the Australia-wide number of road deaths in crashes involving articulated trucks fell by 17 per cent. However, the reduction between 2001 and 2003 was only 3 per cent.

FIGURE 5:
Australian road deaths and fatal crashes involving articulated trucks, articulated truck kilometres travelled, tonne-kilometres, and number of articulated trucks, calendar years 1991 to 2003



Sources: *ATSB fatality and fatal crash data, ABS 'Survey of Motor Vehicle Use' data.*

While road deaths and fatal crashes involving articulated trucks have remained relatively stable since the early 1990s, kilometres travelled, tonne-kilometres, and articulated truck numbers all increased (figure 5). Overall, between 1991 and 2003:

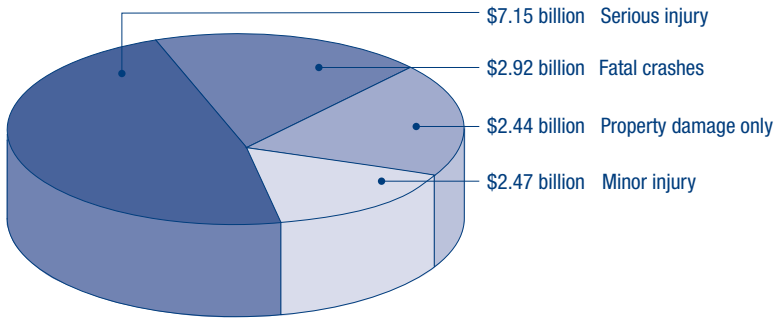
- the fatality rate per kilometre travelled declined by 20 per cent
- the fatality rate per tonne-kilometre declined by 36 per cent
- kilometres travelled by articulated trucks increased by 37 per cent
- articulated truck tonne-kilometres increased by 70 per cent
- articulated truck numbers increased by 18 per cent.

An Australian Truck Crash Database has been developed to investigate the full range of heavy-truck crashes that resulted in serious casualties. The ATSB is analysing available data for the years 2000 and 2002.

Cost of road accidents

Road crashes impose a substantial financial burden on the Australian community as a whole and on particular groups within the community. The cost of road crashes in Australia in 1996 has been conservatively estimated at $15 billion in 1996 dollar values (Road Crash Costs in Australia, Bureau of Transport Economics Report 102, 2000). Figure 6 shows the breakdown of these costs across crashes of different severity categories.

FIGURE 6:
Annual cost of road crashes in Australia, 1996, by type of crash



Source: *BTRE*
All costs are in 1996 dollars.

Rail safety trends

Table 6 presents rail fatalities for the latest available 10-year period. The figures show fluctuations in rail fatalities from year to year, with an overall downward trend.

Table 6:
Australian rail fatalities, calendar years 1993 to 2002

Year	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Australia
1993	16	17	11	3	5	0	0	0	52
1994	18	8	6	4	7	0	0	0	43
1995	16	14	11	3	1	0	1	0	46
1996	9	11	3	2	5	0	0	0	30
1997	21	16	2	2	2	0	0	0	43
1998	25	8	3	3	4	0	0	0	43
1999	19	10	2	2	8	0	0	0	41
2000	14	12	2	3	6	0	0	1	38
2001	14	11	6	1	2	0	0	0	34
2002	12	9	5	0	2	0	1	1	30

Note: *States and territories shown are those in which the death was registered. Suicides are excluded.*

Sources: *Compiled by ATSB using unpublished data from the Australian Bureau of Statistics.*

Table 7:
Costs of rail accidents in Australia – 1999 ($ Million)

Type of costs of rail accidents	Rail accidents		Other rail-related incidents		All rail-related incidents
	Rail accidents excluding level crossing accidents	Level crossing rail accidents	Level crossing acidents involving motor vehicles	Suicides and attempted suicides	
Workplace productivity	20	8	3	19	50
Household productivity	19	8	3	18	48
Medical/ambulance/ rehabilitation	2	0	1	3	6
Quality of life	11	5	2	12	31
Total	52	21	9	53	135
Productivity costs	56	0	1	0	57
Other costs	4	0	0	1	5
Overall total	111	22	10	53	196

Note source BTRE: *All figures are in 1999 dollars, are based on a discount rate of 4 per cent, and are rounded to the nearest million dollars.*

Marine safety trends

Tables 8 and 9 show database details of marine investigations from 1991 to June 2004.

Table 8:
Australian marine investigations by incident type, 1 January 1991 to 30 June 2003, and 1 July 2003 to 30 June 2004.

Incident type	1991–2003	2003–04	Total
Grounding	52	4	56
Collision	32	2	34
Fire/Explosion	21	3	24
Foundering	9	1	10
Structure	5	0	5
Equipment	12	1	13
Berthing	7	0	7
Machinery damage	7	1	8
Accidents causing fatalities	20	5*	25
Accidents causing serious injuries	9	0	9
TOTAL	174	17	191

** One accident resulting in a fatality involved a collision between a ship and a fishing vessel.*

Table 9:
Number of vessels involved in incident investigations by vessel type, 1 January 1991 to 30 June 2003 and 1 July 2003 to 30 June 2004.

Incident type	1991–2003	2003–04	Total
Bulk carrier	80	13	93
Tanker	22	-	22
Container	15	-	15
General	15	3	18
Roll on/roll off	6	-	6
Livestock	5	-	5
Supply/offshore	9	-	9
Tug	5	-	5
Training	4	-	4
Fishing Vessel	23	3	26
Passenger	2	-	2
Pleasure	7	-	7
Other	6	-	6
TOTAL	199	19	218

Table 10:
Total Australian maritime accident casualties and costs, 1993

Year	No. of fatalities	No. of hospital injuries	Cost to the community nominal $m	Cost to the community 1993 $m
1993	73	901	316	316

Source: *BTCE estimates based on data provided by Australian Bureau of Statistics, Australian Departmentof Transport, Australian Maritime Safety Authority, National Injury Surveillance Unit and the Insuranceand Superannuation Commission.*

Aviation safety trends

Australia has a relatively favourable aviation safety record internationally.

Accident information is usually presented in terms of Australia's aviation sectors:

- high-capacity (Regular Public Transport aircraft with a seating capacity greater than 38 seats or a maximum payload exceeding 4,200 kg)
- low-capacity (Regular Public Transport aircraft with a seating capacity of fewer than 39 seats or a maximum payload of 4,200 kg)
- General Aviation (aircraft used for charter, agriculture, training, aerial and private including business operations).

Accidents

Table 11 shows aviation accidents and fatal accidents over the 10-year period 1994 to 2003.

Table 11:
Accidents and fatal accidents involving Australian-registered aircraft by category, calendar years 1994 to 2003

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
High capacity										
All accidents	2	1	1	0	1	7	3	3	1	1
Fatal accidents	0	0	0	0	0	0	0	0	0	0
Low capacity										
All accidents	4	4	2	0	2	3	3	3	4	3
Fatal accidents	0	1	0	0	0	0	1	0	0	0
General aviation										
All accidents	206	216	203	229	208	166	187	176	136	130
Fatal accidents	25	22	23	17	23	21	16	22	10	14

High-capacity aircraft operations continue to be the safest in the country, with extremely low accident rates. As table 11 shows, both high-capacity and low-capacity operations are very safe in terms of the number of accidents reported. For the General Aviation sector, the number of accidents each year is larger, and there is scope to examine trends with more confidence. Figure 7 shows all General Aviation accidents and fatal accidents over the decade to 2003.

Figure 7:
Fatal accidents and total accidents involving Australian-registered General Aviation aircraft, calendar years 1994–2003

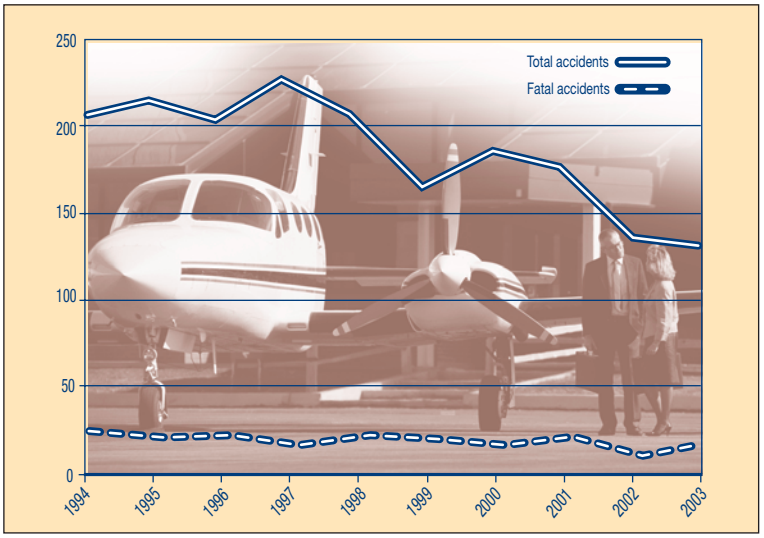


Figure 7 shows a downward trend in total accidents recorded in the General Aviation sector. An additional perspective may be obtained by examining accident rates based on the number of hours flown. Figure 8 shows accident rates for the General Aviation sector in Australia over the 10 years 1994 to 2003.

Figure 8:
Accidents involving Australian-registered General Aviation aircraft per 100 000 hours flown,calendar years 1994–2003

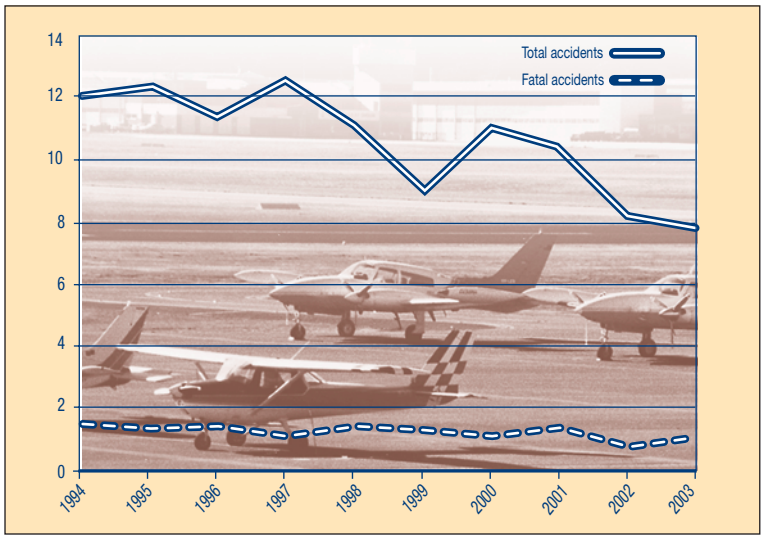


Figure 8 shows a statistically significant overall decrease in the General Aviation accident rate over the last decade.

In addition to hours flown, aviation accident rates can also be estimated in terms of aircraft departures.

From 1994–2003, high capacity activity generally increased, with the only notable decrease occurring in 2002 associated with the collapse of Ansett.

From 1994–2003 activity in the low capacity airline sector initially increased before a period of stability in the late 1990s. In the last two years, activity has decreased by approximately 30% and can in part be attributed to the collapse of Ansett, which has limited the associated regional airlines' activity. Charter activity too has fallen in recent years.

Tables 12, 13 and 14 provide accident information for high-capacity, low-capacity and charter respectively, for the years 1994 to 2003. The data are presented in terms of the categories used by the ATSB to record accidents and incidents. In broad terms, the higher the number, the less serious the occurrence. Categories 1 and 2 are applied if there is a significant threat to public safety, while category 4 is normally used for occurrences where the facts do not indicate a serious safety deficiency or where the deficiency is well-known.

Occurrence categories have varied over time, with the balance between categories 4 and 5 in particular influenced by resource availability and investigator workload.

For the period 1994 to 2003, most high-capacity, low-capacity and charter accidents are category 4.

The ATSB investigation categories by mode are on the website and are reprinted at Appendix 7.

Table 12:
Accidents involving Australian-registered high-capacity aircraft by investigation category, calendar years 1994 to 2003

	Investigation category				
Year	2	3	4	5	Total
1994	1	.	.	1	2
1995	.	.	.	1	1
1996	.	1	.	.	1
1997	.	.	.	.	0
1998	.	.	1	.	1
1999	1	2	3	1	7
2000	.	1	2	.	3
2001	.	.	1	2	3
2002	.	.	.	1	1
2003	.	.	1	.	1

Table 13:
Accidents involving Australian-registered low-capacity aircraft by investigation category, calendar years 1994 to 2003

	Investigation category				
Year	2	3	4	5	Total
1994	.	.	4	.	4
1995	1	.	3	.	4
1996	.	1	1	.	2
1997					0
1998	.	.	2	.	2
1999	.	1	2	.	3
2000	1	.	2	.	3
2001	.	.	2	1	3
2002	.	.	.	4	4
2003	.	.	3	.	3

Table 14:
Accidents involving Australian-registered charter aircraft by investigation category, calendar years 1994 to 2003

	Investigation category				
Year	2	3	4	5	Total
1994	2	5	40	2	49
1995	1	4	36	1	42
1996	.	9	24	1	34
1997	.	3	38	8	49
1998	1	3	37	.	41
1999	.	2	19	.	21
2000	1	3	7	15	26
2001	1	2	7	22	32
2002	.	2	4	13	19
2003	.	2	7	18	27

Table 15 shows that, based on hours flown, both high- and low-capacity aircraft operations have significantly lower accident rates than do charter operations.

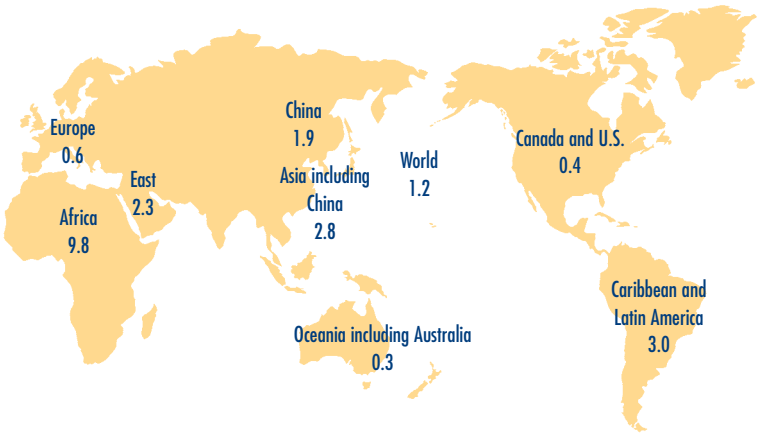
Table 15:
Australian-registered aircraft accidents per 100 000 departures and per 100 000 hours flown (high-capacity, low-capacity and charter), calendar years 1994 to 2003

	High capacity		Low capacity		Charter
Year	Accidents per 100000 departures	Accidents per 100000 hours flown	Accidents per 100000 departures	Accidents per 100000 hours flown	Accidents per 100000 hours flown
1994	0.7	0.3	1.3	1.6	11.5
1995	0.3	0.2	1.3	1.6	9.0
1996	0.3	0.1	0.6	0.8	7.0
1997	0.0	0.0	0.0	0.0	10.1
1998	0.3	0.1	0.6	0.7	8.2
1999	2.4	1.0	0.9	1.1	4.1
2000	0.9	0.4	0.9	1.1	5.4
2001	0.9	0.4	1.1	1.2	6.8
2002	0.3	0.1	1.8	1.9	4.2
2003	0.3	0.1	1.5	1.5	5.8

International comparison

Compared with the rest of the world, Australia has the lowest accident rate for high-capacity aircraft (see figure 9). In Canada for example, the number of accidents per 100 000 hours for such airlines varies each year from 0.4 to 1.2 and was 0.4 in 2001. International comparisons of high-capacity operations are often based on hull losses per million departures.

Figure 9:
International comparison of hull losses per million departures, calendar years 1991 to 2001



Source: Flight Safety Foundation

Figure 9 provides data for the period 1991 to 2001 for the different regions of the world compared with the world average of 1.2 hull losses per million departures. While Oceania, including Australia, is the lowest for the world at 0.3 hull losses per million departures, Australia has never had either a hull loss or a fatal accident involving a high-capacity jet aircraft. Oceania covers a large area and goes as far north as Guam. It is less economic to repair older aircraft and hull loss data are in some measure biased by the age of aircraft involved in serious accidents.

Incidents

Compared with accidents, there are considerably more incidents recorded. Tables 15 to 17 show the incidents recorded by investigation category for high-capacity, low-capacity and charter aircraft.

Table 16:
Reported incidents involving Australian-registered high-capacity aircraft by investigation category, calendar years 1994 to 2003

	Investigation category				
Year	2	3	4	5	Total
1994	.	8	46	763	817
1995	.	10	55	711	776
1996	.	5	60	660	725
1997	.	7	264	572	843
1998	.	2	580	781	1363
1999	.	1	551	1058	1610
2000	.	4	76	1627	1707
2001	.	10	33	1661	1704
2002	.	2	26	1690	1718
2003	.	2	10	1418	1430

Table 17:
Incidents involving Australian-registered low-capacity aircraft by investigation category, calendar years 1994 to 2003

	Investigation category				
Year	2	3	4	5	Total
1994	.	5	26	307	338
1995	.	.	26	294	320
1996	.	.	28	328	356
1997	.	4	156	277	437
1998	1	2	313	257	573
1999	.	2	289	382	673
2000	1	4	37	750	792
2001	.	4	15	715	734
2002	1	.	6	534	541
2003	.	.	4	542	546

Table 18:
Incidents involving Australian-registered charter aircraft by investigation category, calendar years 1994 to 2003

	Investigation category				
Year	2	3	4	5	Total
1994	.	2	15	290	307
1995	.	1	16	339	356
1996	.	.	21	342	363
1997	.	.	96	244	340
1998	.	1	187	218	406
1999	.	3	173	233	409
2000	.	.	16	414	430
2001	.	1	7	336	344
2002	.	.	4	385	389
2003	.	.	2	358	360

Tables 16 and 17 show the numbers of incidents reported for high and low capacity aircraft by investigation category. The introduction of electronic incident reports from Airservices Australia during 1998 contributed to an overall increase in incidents reported since that year. The improvement in reporting also suggests a growing safety culture within the airlines. The ATSB also contributed to the increase by adopting a more comprehensive incident recording policy during this period including recording all reported bird strikes instead of only those seriously damaging aircraft.

Table 19 shows reported incident rates for high-capacity, low-capacity and charter aircraft. In contrast to reported charter accidents per 100 000 hours (see table 15), charter incidents per 100 000 hours are significantly fewer than those reported by the high-capacity and low-capacity sectors. This is likely to reflect the better reporting culture within the Regular Public Transport (RPT) sectors.

Table 19:
Incidents involving Australian-registered aircraft (high-capacity, low-capacity and charter), calendar years 1994 to 2003

	High capacity		Low capacity		Charter
Year	Incidents per 100000 departures	Incidents per 100000 hours flown	Incidents per 100000 departures	Incidents per 100000 hours flown	Incidents per 100000 hours flown
1994	301.3	133.4	108.7	138.0	71.9
1995	264.5	116.5	103.2	129.0	75.9
1996	242.0	102.9	109.6	137.9	75.1
1997	285.6	117.4	134.4	157.9	69.9
1998	465.1	192.4	173.9	200.7	81.6
1999	548.8	226.9	203.1	235.8	80.6
2000	528.1	219.6	242.4	277.2	89.6
2001	501.4	213.3	266.6	294.5	73.4
2002	553.9	238.8	245.5	259.5	88.0
2003	437.5	188.5	268.9	278.8	83.4

Cost of aviation accidents

As with other transport modes, aviation accidents result in considerable losses to the community in terms of costs, fatalities and injuries. The Bureau of Transport Economics estimated that the cost of aviation accidents was close to $112 million in 1996 (see table 20). Reportedly, the direct cost of the 1999 QF1 Bangkok runway overshoot by a 747 was of the order of $100m. A 747 accident involving large numbers of fatalities could involve billions of dollars in overall costs.

Table 20:
Estimated cost of aviation accidents in 1996

Category	Cost/losses ($ thousand)
Productivity losses	65 075
Property damage	20 854
Loss of quality of life	16 100
Insurance administration	3733
Legal costs	326
Emergency services	988
Accident investigation	1648
Medical costs	1314
Rehabilitation/long term care	446
Workplace costs—non-victim	994
Premature funeral costs	64
Total	**$111 542**

Source: Bureau of Transport Economics, 1999

Internal management and processes

Financial overview

In 2003–04 the ATSB received funding of $12.568m, including $0.336m through revenue and $0.204m for capital expenditure, to deliver its safety outputs. New Federal Budget funding of $13.2 million over four years was received for three new functions of interstate rail safety investigation, a confidential marine safety reporting system, and to undertake aviation research and data analysis. As with other groups, the Department applied a cut of 10.7 per cent to the ATSB's 2003–04 budget as part of its 'workout/workup' strategy.

Comparisions	2000–01 ACTUAL $ million	2001–02 ACTUAL $ million	2002–03 ACTUAL $ million	2003–04 ACTUAL $ million	2004–05 BUDGET $ million
ATSB Departmental expenses					
Employee expenses	9.137	8.238	8.195	8.860	11.049
Supplier expenses[1]	5.021	3.786	3.689	2.895	5.367[2]
Depreciation/amortisation expenses	0.156	0.240	0.424[3]	0.419	0.524[4]
Other expenses	0.277	0.144	0.004	0.190	0.349[5]
Total Departmental expenses	14.591	12.407	12.312	12.364	17.289
Revenue	0.256	0.273	0.388	0.336	0.100
Net cost to Department	14.335	12.134	11.924	12.028	17.189
Capital Expenditure					
Plant & Equipment[6]	0.909	0.927	0.600	0.204	0.420
Staffing					
Average staffing level (FTE)	114	105	92	89	105

In May 2004, the Government announced additional Federal Budget funding for the ATSB to increase the number of aviation safety investigations conducted annually and for the replacement of the ATSB's aviation investigation database. Subsequently the ATSB was allocated a further $1.000m of internal departmental funding (a carryover from 2003–04) for a new novice driver training road safety initiative. The ATSB was not required in 2004–05 to make a further contribution (4.1%) to the DOTARS 'work out/work up' funding requirements and also received internal funding supplementation for additional employee expenses pursuant to the DOTARS Certified Agreement 2004–06 which was ratified on 5 August 2004.

The 2004–05 Portfolio Budget Statements include the ATSB's departmental expenses under Outcome 1 'A better transport system for Australia' in three outputs. The Department's corporate group has provided corporate overhead and capital use charge funding to compare the ATSB's operating budget for 2001–02, 2002–03 and 2003–04 against the ATSB's budget for 2004–05.

ATSB funding by output ($m)

	2001–02 PBS Revised	2002–03 PBS Revised	2003–04 PBS	2003–04 PBS Revised	2004-05 PBS	2004-05 PBS Revised
Output 1.1 Transport Policy Advice						
ATSB[7]	1.169	1.093	0.855	0.724	0.677	0.728
Corporate[8]	0.582	0.534	0.412	0.564	0.968	0.968
CUC[9]	0.016	0.016	0.000	0.000	0.000	0.000
Total	**1.767**	**1.643**	**1.267**	**1.288**	**1.645**	**1.696**
Output 1.3 Transport Safety Investigation						
ATSB	6.542	5.910	9.033	9.061	10.267	10.908
Corporate	3.256	2.985	4.347	4.430	6.546	6.546
CUC	0.087	0.089	0.000	0.000	0.000	0.000
Total	**9.885**	**8.984**	**13.380**	**13.491**	**16.813**	**17.454**
Output 1.5 Transport Research and Data						
ATSB	4.992	5.191	5.416	4.103	4.416	5.653
Corporate	2.485	2.278	2.569	2.827	3.599	3.599
CUC	0.067	0.068	0.000	0.000	0.000	0.000
Total	7.544	7.537	7.985	6.930	8.015	9.252
Grand Total	**19.196**	**18.164**	**22.632**	**21.709**	**26.473**	**28.402**

Notes:

1 *Includes funding for road safety public communication, which from 2000–01 to 2001–02 was provided through revenue from the Administered Black Spot Programme. Funding from 2002–03 onwards has been added to the ATSB's base allocation for supplier expenses for the duration of the current programme.*

2 *Includes a $1m carryover for a road safety novice driver education trial.*

3 *Includes funding for part year depreciation of IT assets capitalised in June 2003.*

4 *Includes funding for part year depreciation of plant & equipment to be acquired in 2004–05.*

5 *Includes funding for two new budget measures: increased aviation investigations and replacement of the aviation investigation database; also includes internal funding allocation for new novice driver training initiative.*

6 *ATSB agreed during 2001–02 to transfer responsibility for the management of all its current and future IT capital projects to the corporate group.*

7 *Direct funding to the ATSB.*

8 *Corporate overhead funding within the Department attributed to the ATSB.*

9 *Capital use charge funding attributable to the ATSB.*

Comparison of staffing levels (FTE) 2003–04 and 2004–05

Classification level	Actual 2003–04	Projected 2004–05
Executive Director	1.0	1.0
Director	2.0	1.2
Deputy Director Transport Safety Investigation	2.0	2.8
Team Leader Transport Safety Investigation	6.3	6.0
Senior Transport Safety Investigator	40.7	49.0
Transport Safety Investigator	1.3	6.0
Executive Level 2	3.4	6.2
Executive Level 1	6.1	9.7
Australian Public S ervice Level 6	9.8	9.8
Australian Public Service Level 5	6.9	8.9
Australian Public Service Level 4	4.5	1.7
Australian Public Service Level 3	3.5	3.0
Australian Pubic Service Level 2	1.0	0.0
TOTAL	**88.5**	**105.3**

Risk management

The ATSB's risk management plan outlined a number of risks faced and suggested how the bureau might respond to the more serious ones. Major risks included:

- Criticism of investigation of fatal accidents and expert advice to coroners
- Inappropriate administration of legislation
- Information or data provided by the ATSB discredited as inaccurate or deficient
- The ATSB's role in safety, particularly in aviation, is targeted as a major public issue
- Outside pressure on an investigation and/or investigation process not seen as independent and unbiased
- Ministers or Departmental Executive regards ATSB advice as inadequate
- Loss and competencies of key staff.

People profile

The ATSB values staff who are committed to helping prevent transport deaths and injuries. It seeks to develop a satisfied, capable and productive workforce that is well managed to achieve 'results through people'.

ATSB staff work within the APS Values and Code of Conduct set out in the Public Service Act. Further responsibilities are outlined in the Financial Management and Accountability Act and other legislation.

The ATSB ensures there are clear linkages between individual Plans-on-a-Page, unit business plans and the Department's Portfolio Budget Statements. Six-monthly performance exchanges with staff allow supervisors to give and receive feedback comments, review Results-on-a-Page and discuss learning and development needs.

The ATSB is a diverse community of team players and encourages staff to work efficiently and effectively and reach their potential in a safe, fair and flexible workplace.

Overview of key safety outputs

FIGURE 10:
ATSB occurrence investigations initiated/in process/completed (aviation, marine and rail modes)

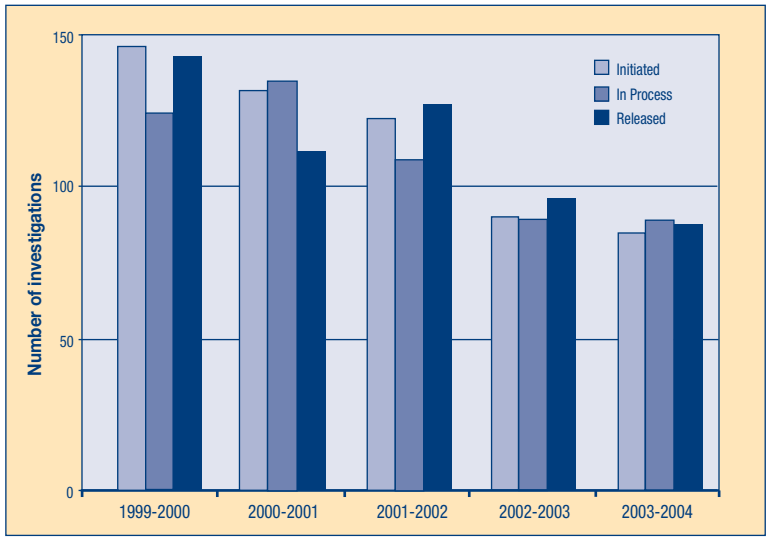
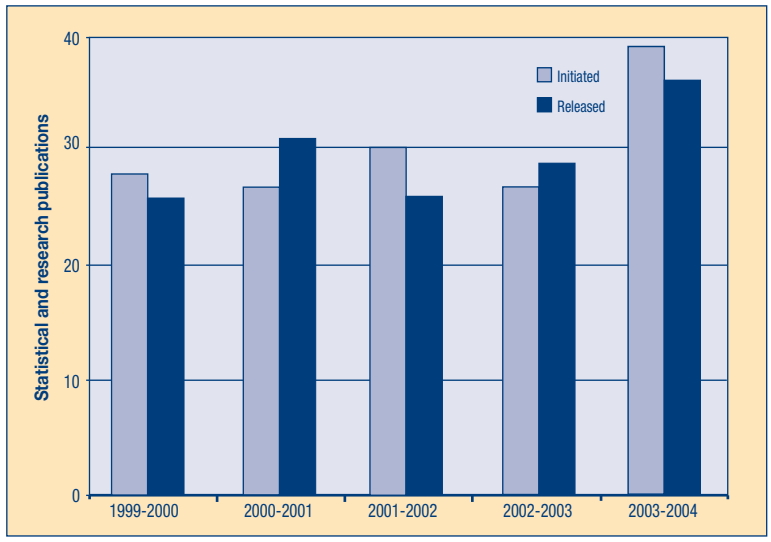


FIGURE 11:
ATSB statistical and research publications initiated/complete



Progress of the TSI Act and regulations and memoranda of understanding

In 2003–04 the ATSB instigated 75 air, seven marine and five rail investigations under the *Transport Safety Investigations Act 2003* (TSI Act). The five rail safety investigations were instigated on the Defined Interstate Rail Network using the Bureau's enhanced rail investigation powers under the TSI Act.

The ATSB also signed Memoranda of Understanding (MoUs) with five Rail Safety Regulators, Comcare, Airservices Australia, and one State Coroner, and is progressing MoUs with two other Rail Safety Regulators, other State and Territory Coroners, CASA, AMSA, Police agencies, and Defence Flight Safety in the Australian Defence Force.

Relevant training and the development of a Policy and Procedures Manual on implementing the TSI Act have helped familiarise ATSB staff with the requirements of the new Act. ATSB officers have spoken at different industry forums to promote stakeholder awareness of the TSI Act and Regulations and the Bureau has inserted articles and information in publications relevant to the Aviation, Marine and Rail industries.

Training and development

Diploma of Transport Safety Investigation

During 2003–04 ATSB staff continued to work towards the Diploma of Transport Safety Investigation for which it received National accreditation in 2002–03. To date seven staff have completed the course and have been awarded the Diploma and 15 staff have qualified for the Certificate IV in Assessment and Workplace Training, enabling them to train and assess at the Diploma level. A further 16 staff are progressing towards the Diploma award.

Major accident preparedness

In September 2003, the ATSB undertook a full-scale practical major accident preparedness exercise, simulating a major airliner accident at Albury. All the groups and organisations who would normally be involved participated, and the ATSB established its full investigating infrastructure as would happen in the event of a major accident.

Human factors courses

The ATSB periodically offers an introductory course in Human Factors for Transport Safety Investigators. This one-week course provides a general overview of human factors in safety-critical systems and provides participants with opportunities to improve their awareness of how human factors issues can be considered during a transport safety investigation. The course was originally designed to meet the training needs of ATSB aviation safety investigators. However, the course has been made available to ATSB marine and rail investigators, a limited number of industry participants from state and international government transport safety investigation agencies, airline safety departments, and rail and marine safety organisations.

The ATSB held two human factors courses in Canberra in 2003–04 (24 November – 28 November 2003 and 3 May – 7 May 2004) and 21 participants attended each course. They included ATSB and Australian Defence Force personnel, and transport safety personnel from the Australian aviation, marine and rail industries and participants from Taiwan, Japan, and New Zealand.

Workforce planning

Replacing the ATSB's specialist staff is generally not easy and resources constrain duplicating or actively recruiting certain specialist positions ahead of time. To ensure that critical positions, such as those of transport safety investigators, remain filled, the ATSB monitors expected staff departures. The ATSB also considers consultancy assistance to augment its staff if required.

Asset management

The ATSB has assets with a book value of $1.605m including specialist computer equipment and software (such as for air traffic control and aircraft data recorder analysis), a teleconferencing unit, and technical equipment such as electron and optical microscopes. These assets are subject to depreciation. The written down value of assets traded in or disposed of during the year was $0.021m.

Access and equity

In November 2000, the Australian Transport Council adopted the National Road Safety Strategy 2001–10. Noting that not all road users enjoy the same level of safety, the Strategy commits the ATSB to improving equity among road users.

Targeted groups include:

- youth and older people
- indigenous Australians
- Australians from a non-English speaking background
- residents in rural and remote areas
- pedestrians, cyclists and motorcyclists.

The National Road Safety Strategy and the Action Plan for 2003 and 2004 also address equity issues specific to indigenous road safety. In 2003–04 the ATSB supported continued collaboration among jurisdictions on indigenous road safety issues by:

- commissioning an ARRB Transport Research scoping study of indigenous road safety which examined current databases and research and identified priorities for action. The study report was released in August 2004.

The Charter of Public Service in a Culturally Diverse Society represents a nationally consistent approach to ensuring that government services are delivered in a way that is sensitive to the language and cultural needs of all Australians. The ATSB as part of the Department is committed to ensuring its programmes are accessible and equitable to all Australians. The ATSB places all key reports on its website in PDF, and increasingly in HTML, format.

Aboriginal reconciliation

The Council of Australian Governments (COAG) has requested that ministerial councils develop action plans, performance reporting strategies and benchmarks for Aboriginal reconciliation where these do not already exist.

To help implement the Strategy and the Action Plan, the ATSB convened the Indigenous Road Safety Working Group and a forum being held in September 2004 in Alice Springs. This will be the third such forum organised by the ATSB.

Disability strategy

The Department is also committed to the Australian Government's Disability Strategy. The ATSB is increasingly placing its key reports on the website using HTML, where this is practicable, to assist those with a disability.

Government online and e-services initiative

ATSB online services are supplied concurrently with those of the Department via an integrated website content management system and secure hosting solution. The ATSB website provides online purchasing to facilitate cost recovery for a selection of material from within its wide range of safety information products.

Other ATSB online services and initiatives implemented in 2003–04 included:

- a secure online Aviation Self Reporting Scheme (ASRS) form.
- a secure online Confidential Marine Reporting Scheme (CMRS) form.
- a secure online Rail Investigation Reports Database Application.
- electronic dissemination for the Weekly Summary of (aviation) Notifications.

Occupational health and safety

All ATSB investigators receive occupational health and safety training during their induction and are vaccinated against possible bloodborne pathogen hazards while conducting an on-site investigation. Recurrent OH&S training has now been introduced for all investigators. The ATSB has also increased its number of OH&S representative positions from two to five.

During 2003–04 the ATSB also provided information and training to emergency services personnel about the hazards likely to be encountered at accident sites.

In 2003–04 the ATSB again offered influenza inoculations to staff, with 33 per cent of employees taking up the offer.

Looking ahead

Significant tasks to be undertaken in 2004–05 include:

- Conduct up to 100 new aviation occurrence and technical analysis investigations while managing new staff recruitment and training; conclude old Air Navigation Act reports; review the Civil Aviation Act to enable broadening of ASRS
- Evaluate any problems or gaps in the Transport Safety Investigation Act and Regulations or recommended by the ICAO audit and develop solutions
- Prepare the tender for the replacement Aviation safety database and associated functions
- Improve the quality and timeliness of up to 10 new rail investigations; establish an Adelaide office; work with industry to broaden national safety data
- Conduct up to 10 new marine investigations; issue up to 10 safety notices from the marine confidential reporting system
- Obtain Australian Transport Council agreement to a new road safety Action Plan for 2005 and 2006; help respond to the 'Eyes on the road ahead' report; publish a national novice driver education 'insight' curriculum and seek to facilitate a statistically significant trial; publish up to 30 road safety statistical and research reports
- Conduct a desktop major aviation accident exercise linked to the new CAVDISPLAN and improve on any weaknesses
- Further develop truck safety databases and analysis and contribute to national research on fatigue and on drugs
- Contribute to international safety improvements including through the IMO, ICAO, FSF, ISASI, ITSA, and MAIIF.

Because much of the ATSB's work is necessarily reactive, many investigations will be undertaken in 2004–05 that were unknown at the beginning of the financial year.

Appendixes

Appendix 1: Research, statistical, and other non-investigation publications released in 2003–04

The ATSB released the following publications during 2003–04. Most are available on the Bureau's website www.atsb.gov.au or can be obtained by telephoning 1800 621 372.

Road safety research reports

- *Benefits of Retrofitting Seat Belt Reminder Systems to Australian Passenger Vehicles* (CR 215)
- *Potential Benefits and Costs of Speed Changes on Rural Roads* (CR216)
- *Prospects for improving the conspicuity of trains at passive railway crossings* (CR217)
- *Review of the Literature on Daytime Running Lights* (CR218)

Road safety statistics reports

- Twelve issues of the monthly bulletin *Road Fatalities in Australia*
- *Transport accident fatalities: Australian with other OECD Countries 1980–1989*
- *Road fatalities Australia: 2002 statistical summary*
- *Serious injuries due to road crashes*
- *Fatal Crash Rates 1925–2002*
- *Heavy truck crashes at 500 to 1499 kilometres outward distance from base, 1998 to 2000*
- World Health Day publication on *Road Safety in Australia*

Rail occurrence database reports

- *Level crossing accident fatalities*
- *Railway accident fatalities – latest data*

- *Railway accident fatalities – International comparisons*
- *Railway accident fatalities – Historical data*
- *Rail Accident Investigation – Guidelines for Railway Network Owners, Railway Operators and Emergency Services Personnel – Edition 1 – June 2004*
- *Civil and Military Aircraft Accident Procedures for Police Officers and Emergency Personnel – Edition 2 – June 2004.*

Aviation safety articles in CASA's Flight Safety Australia *(ATSB supplement)*

July–August 2003

- *Recently completed investigations (lists investigations from March– April 2003)*
- *DH82A accident*
- *Safety Briefs* (Failed variable stator vane control lever; Loss of directional control during take-off; Loss of separation standards; Rotor blade skin disbanding; Collision with powerlines; Inadequate pushback procedures; Engine power loss)
- Confidential Aviation Incident Reporting (CAIR).

September–October 2003

- *Recently completed investigations (lists investigations released June–July 2003)*
- *The ATSB gets a new Act*
- *Safety Briefs* (Hand start leads to runaway aircraft; Loss of normal aircraft handling characteristics; Engine flame-out; Controlled flight into water at night; Close encounter in GAAP circuit; Collision with trees after late go around)
- Confidential Aviation Incident Reporting (CAIR).

November–December 2003

- *Recently completed investigations (lists investigations released August–October 2003)*
- *Exercise Popflot*

- *Safety briefs* (Collision with ground; Loss of control/collision with ground; Loss of engine power; Loss of separation standards; Hydraulic mist in passenger cabin; Traffic confliction in GAAP).

January–February 2004

- Invitation for applications for Aviation Safety Research Grants Programme 2004
- *ATSB wins International Award*
- *Safety briefs* (Failure of outer wheel bearing; Accident incorrectly loaded; Uncommanded in-flight engine shutdown; Collision with ground during spraying; Ground resonance event; Unexpected weather conditions.)

March–April 2004

- *Near crash from icing prompts call for better stall warning*
- *Aviation Self Reporting Scheme*
- *Safety briefs* (Fumes in the cabin and on the flight deck; Collision with ground; Smoke on the flight deck; Faulty emergency pressurisation valve; Failure of number 3 engine; Landing gear malfunction.)

May–June 2004

- *ATSB Funding Boost*
- *Air Safety Occurrence Reporting Requirements*
- *Safety briefs (*Fumes on the flight deck; Suspected carburettor icing; Airprox event; Loss of cabin pressure; Loss of separation standards; inflight loss of control.)

Air safety research reports

- *Runway Incursions: 1997 to 2003*
- *General aviation fatal accidents: How do they happen?*
- *Light Utility Helicopter Safety in Australia*
- *ATSB Aviation Safety Survey – Common Flying Errors*
- *Review of Midair Collisions Involving General Aviation Aircraft in Australia between 1961 and 2003*

- *NAS stage 2b: analysis of ATSB occurrence data*
- *Alcohol and Human Performance from an Aviation Perspective: A Review*
- *Cannabis and its Effects on Pilot Performance and Flight Safety: A Review*
- *Cross Modal Safety Comparisons*
- *Aviation Safety Research Grants Programme 2004–2005*
- *Aviation Industry Safety Survey FAQ.*

Appendix 2: Safety research grants 2003–04

Road safety research grants

Successful applications

Four grants were awarded for work to be undertaken under the Road Safety Research Grant Scheme funded by the ATSB:

Benefits of ADR69 and airbags in Australia

Applicant: Mr Michael Fitzharris, Monash University Accident Research Centre

This case-control study aims to evaluate the safety benefits of Australian Design Rule (ADR) 69 and frontal airbag systems. Using in-depth real world crash data, injury outcomes and associated cost of injury will be measured with societal benefits being calculated. Strengths of ADR69 and areas requiring improvement will be discussed.

ADR 69 is a performance-based standard which requires vehicle manufacturers to design their Australian passenger models to meet specific injury criteria for a particular crash configuration. The design changes required to meet this regulation were left up to individual manufacturers, but most manufacturers included airbags as part of their new designs. ADR 69 came into effect in July 1995.

Driver fatigue – Quantifying impairment

Applicant: Dr Stuart D.Baulk, University of South Australia

Fatigue-related driving accidents are preventable and may decrease with a systematic fatigue management approach. Such systems are being implemented in many industries, having been validated against laboratory performance tests. This research will measure and compare the effects of fatigue on performance using a simple test of visual reaction time (Psychomotor Vigilance Test (PVT) and an interactive driving simulation task. It will also examine the effects of fatigue on perception of performance and motivation of drivers to continue, and examine the effects of gender on fatigue, driving performance and perception.

Rider risk assessment measure

Applicant: Mr Barry Watson, Centre for Accident Research and Road Safety, Queensland University of Technology

A Rider Risk Assessment Measure (RRAM) will be developed to assess self-reported rider behaviour and intentions, along with the personal, social and environmental factors contributing to unsafe riding practices. This will provide a valuable tool for researching rider behaviour, evaluating rider safety countermeasures and informing rider training and education programs.

Road safety barriers made from interlocking blocks of special geometry

Applicant: Professor Arcady Dyskin, School of Civil and Resource Engineering, University of Western Australia

Thee project will explore the potential of the novel design principle, called topological interlocking, for road safety barriers with improved failure resistance, energy absorption capacity and reusability. Design recommendations for full-scale barriers will be made on the basis of mechanical tests on scaled physical models supported by dimensional analysis.

Aviation safety research grants

Successful applications

Five grants were awarded the work to be undertaken under the aviation safety research grants being funded by the ATSB:

Fire safety of advanced composites for aircraft

Applicant: Professor Adrian Moritz

Fire is a leading cause of aircraft accidents, and therefore fire-safe materials must be used in aerospace structures. High-performance composite materials have recently been developed for next-generation aircraft structures, however their safety in aircraft fires has not been fully investigated. This project will evaluate and rank the fire safety of next-generation aircraft composites.

Cognitive analysis of factors leading to the misinterpretation of weather radar systems amongst pilots

Applicant: Dr Mark Wiggins

Recent investigations of aircraft incidents revealed a number of problems associated with pilots' use of weather radar systems. This research project will examine the factors that lead to the misinter-

pretation of weather radar data, and identify and develop effective countermeasures for the aviation industry.

Implementation of fatigue management programs

Applicant: Dr T Leigh Signal

This study will focus on how fatigue management programs are being instituted within the aviation industry in New Zealand. This is the first step in an overall assessment of the effectiveness of an alternative to prescriptive flight and duty times for managing fatigue in aviation.

A model for assessing risk categories for birds at airports using bird census dta to permit semi-quantitative risk analysis

Applicant: Mr P Shaw

This project will develop an objective model for assessing risk categories for the various species found at any particular airport wishing to apply the model.

Error management in aviation training

Applicant: Dr M Thomas

Human error remains a significant factor in the majority of aviation incidents and accidents. This study will work towards providing the Australian aviation industry with a training package for flight crew error management training.

Appendix 3: Investigation reports released in 2003–04

Rail reports released

Occurrence Date	Rail accident or incident	Report release
03 Feb 2003	Runaway commuter train accident at Spencer Street Station, Melbourne	01 Dec 2003
23 May 2003	Collision at a level crossing at Aloomba, Queensland	09 Dec 2003

Reports completed

Occurrence Date	Rail accident or incident	Report release
16 Feb 2003	Derailment and collision between trains at Chiltern, Victoria	Forwarded to the Victorian Minister of Transport for his consideration

Marine reports released

Report Number	Vessel(s)	Date	Location	Date released
172	*Captain Aysuna*	08 Oct 2001	Bass Strait	26 Aug 2003
180	*Taharoa Express*	11 Jul 2002	Dampier, WA	26 Aug 2003
170	*Anl Purpose*	06 Aug 2001	Coral Sea	05 Sep 203
189	*Golden Bridge*	10 Dec 2002	South of Norah Head, NSW	25 Sep 2003
182	*Doric Chariot*	29 Jul 2002	Piper Reef, GBR	25 Sep 2003
185	*Fv Tamara*	01 Sep 2002	150 nm off Qld. coast	09 Dec 2003
183	*Marion Green*	28 Jul 2002	Off south coast of WA	09 Dec 2003
184	*Hanjin Dampier*	25 Aug 2002	Dampier, WA	22 Dec 2003
177	*Sea Breeze/Forum Samoa*	11 Apr 2002	Cape Moreton, QLD	22 Dec 2003
159	*Star Sea Bridge/Fv Sue M*	21 Jun 2000	Off Evans Head, NSW	26 Feb 2004
194	*Medi Monaco**	17 May 2003	Geelong, VIC	03 May 2004
201	*Yu Long Shan**	11 Mar 2004	At anchor off Hay Point, QLD	14 Jun 2004
199	*Bunga Orkid Tiga/Stella 7**	05 Jan 2004	Nr Creech Reef, GBR	14 Jun 2004
197	*Pacific Wisdom**	07 Sep 2003	Albany Harbour, WA	30 Jun 2004
192	*Pactrader**	01 Mar 2003	Thevenard, SA	30 Jun 2004
188	*Ma Cho**	09 Dec 2002	Devonport, TAS	30 Jun 2004
176	*La Pampa**	27 Mar 2002	Gladstone, QLD	30 Jun 2004

Marine Investigation reports on behalf of NSW Ferries

The ATSB completed its investigation reports into two Sydney ferries and forwarded the reports to NSW.

- the collision of the ferry Betty Cuthbert at Cockatoo Island on 19 February 2004
- the collision of the ferry Lady Heron at Circular Quay on 20 February 2004.

Aviation investigation and technical analysis reports released

No	Occurrence number	Occurrence date	Occurrence type	Registration	Location	State	Date released
1	200204663	13 Oct 2002	Accident	VH-PDK	2km W Bungendore	NSW	08 Jul 2003
2	200300685	06 Mar 2003	Incident	VH-IPB	Sydney, Aerodrome	NSW	09 Jul 2003
3	200205223	07 Nov 2002	Accident	VH-EHL	4km S Cradle Mountain (Valley)	TAS	10 Jul 2003
4	200203094	08 Jul 2002	Incident	VH-TJT/VH-HKX	324km NNE Melbourne, VOR	VIC	18 Jul 2003
5	200200651	01 Mar 2002	Accident	VH-WFX	Williamtown, Aerodrome	NSW	18 Jul 2003
6	200301185	25 Mar 2003	Accident	VH-COQ	Groote Eylandt, Aerodrome	NT	29 Jul 2003
7	200205307	01 Nov 2002	Incident	VH-NJD	Perth, Aerodrome	WA	06 Aug 2003
8	200204912	20 Oct 2002	Incident	VH-NJL	6km E Karratha, Aerodrome	WA	06 Aug 2003
9	200203030	29 Jun 2002	Incident	VH-YAD	37km S Brisbane, Aerodrome	QLD	08 Aug 2003
10	200205865	02 Dec 2002	Incident	VH-NJX	Perth, Aerodrome	WA	08 Aug 2003
11	200204857	19 Oct 2002	Accident	VH-BVA	Chance Bay, Whitsunday Island	QLD	11 Aug 2003
12	200205216	06 Nov 2002	Incident	VH-VEM	Parafield, Aerodrome	SA	14 Aug 2003
13	200105338	06 Nov 2001	Serious Incid.	9V-SPP	19km SE Nyngan, Aerodrome	NSW	09 Sep 2003
14	200300674	06 Mar 2003	Accident	VH-AQV	Whitehaven Beach	QLD	10 Sep 2003
15	200200646	01 Mar 2002	Accident	G-BNLD	159km NW Parkes, VOR	NSW	12 Sep 2003
16	200204471	25 Sep 2002	Incident	VH-AAG/VH-MAQ	Bankstown, Aerodrome	NSW	15 Sep 2003
17	200200548	22 Feb 2002	Accident	VH-KTV/OK-GUU39	Jandakot, Aerodrome	WA	24 Sep 2003

Note: *Statistics on numbers of aviation investigations instigated, released and underway may vary over time due to factors including reclassifications and discontinuations.*

No	Occurrence number	Occurrence date	Occurrence type	Registration	Location	State	Date released
18	200301990	03 May 2003	Incident	VH-TJY	Melbourne, Aerodrome	VIC	15 Oct 2003
19	200206005	20 Dec 2002	Accident	VH-CIV	6km NE Drysdale	VIC	22 Oct 2003
20	200002157	31 May 2000	Accident	VH-MZK	28km SE Whyalla, Aerodrome	SA	28 Oct 2003
21	–	25 Jun 2003	Tech Analysis		NSW Coroner, Ultralight accident	NSW	10 Nov 2003
22	200201725	24 Apr 2002	Incident	VH-TAF/VH-ASN	130km ESE Darwin, (VOR)	NT	11 Nov 2003
23	200203671	10 Aug 2002	Serious Incid.	G-BNLK	6km N Sydney, Aerodrome	NSW	17 Nov 2003
24	200300008	09 Jan 2003	Incident	VH-FNA	Southern Cross, (ALA)	WA	26 Nov 2003
25	200100591	04 Feb 2001	Accident	VH-BBI	1km E Lake Evella, Aerodrome	NT	02 Dec 2003
26	200300011	13 Jan 2003	Accident	VH-AZH	Bendora Dam	ACT	02 Dec 2003
27	200300982	19 Mar 2003	Accident	VH-MTX	Caboolture, (ALA)	QLD	04 Dec 2003
28	200304963	03 Dec 2003	Incident	VH-AAI/VH-VOP	Canty, (IFR)	VIC	17 Dec 2003
29	200201025	13 Mar 2002	Incident	VH-HVM/VH-TJP	130km ENE Adelaide, VOR	SA	05 Jan 2004
30	200205895	15 Dec 2002	Incident	VH-OJU	Los Angeles, Aerodrome	Other	06 Jan 2004
31	200305235	24 Dec 2003	Serious Incid.	VH-VBV/VH-TBA	19km N Launceston, Aerodrome	TAS	16 Jan 2004
32	200105821	02 Dec 2001	Serious Incid.	VH-CZQ`	19km SE Thangool, Non Directional Beacon	QLD	16 Jan 2004
33	200203074	28 Jun 2002	Serious Incid.	VH-OLM	7km ESE Bathurst, Non Directional Beacon	NSW	28 Jan 2004

No	Occurrence number	Occurrence date	Occurrence type	Registration	Location	State	Date released
34	200301435	04 Apr 2003	Incident	VH-EBA	Sydney, Aerodrome	NSW	17 Feb 2004
35	200300929	14 Mar 2003	Accident	VH-RPI	0.3km SE Trefoil Island (ALA)	TAS	18 Feb 2004
36	200105715	05 Dec 2001	Serious Incid.	VH-XDZ	93km NE Trepell, (ALA)	QLD	26 Feb 2004
37	200204328	26 Sep 2002	Accident	VH-MAR	Hamilton Island, Aerodrome	QLD	10 Mar 2004
38	200203449	29 Jul 2002	Accident	VH-CNW/VH-EUH	Moorabbin, Aerodrome	VIC	10 Mar 2004
39	200202710	11 Jun 2002	Serious Incid.	VH-VOE	Darwin, Aerodrome	NT	18 Mar 2004
40	200401052	29 Jan 2004	Tech Analysis		Canberra Head Office, Named feature	ACT	29 Mar 2004
41	200300698	07 Mar 2003	Incident	N109UA	Melbourne, Aerodrome	VIC	29 Mar 2004
42	200401024	23 Mar 2004	Accident	VH-NTH	Darwin, Aerodrome	NT	31 Mar 2004
43	200302037	05 May 2003	Incident	VH-IMD	Melbourne, Aerodrome	VIC	31 Mar 2004
44	–	09 May 2003	Technical Analysis		Air North, Fracture of Turbine Bolts	ACT	31 Mar 2004
45	200303599	12 Aug 2003	Accident	VH-UBC	2km W Mullengandra	NSW	15 Apr 2004
46	200401181	31 Mar 2004	Accident	VH-HHD	56km NNW Charters Towers, (ALA)	QLD	16 Apr 2004
47	200401390	20 Apr 2004	Incident	9M-MPE	Ceduna	SA	21 Apr 2004
48	200201846	05 May 2002	Accident	VH-IBK/VH-JTV	2.3km ESE Bankstown, Aerodrome	NSW	04 May 2004
49	200303804	29 Aug 2003	Incident	VH-BHY	North Rankin A Platform, Helicopter Landing Site	WA	11 May 2004
50	200302403	27 May 2003	Incident	VH-FIG/VH=AUC	Jandakot, Aerodrome	WA	12 May 2004

No	Occurrence number	Occurrence date	Occurrence type	Registration	Location	State	Date released
51	200205705	02 Dec 2002	Incident	VH-BHY	Karratha, Aerodrome	WA	21 May 2004
52	200400265	22 Jan 2004	Incident	VH-DBG	19km E Derby, Aerodrome	WA	21 May 2004
53	200205540	16 Nov 2002	Serious Incid.	VH-SBT/VH-VQC	Mackay, Aerodrome	QLD	25 May 2004
54	199803826	14 Sep 1998	Accident	VH-HMR	Myroodah Station, (ALA)	WA	09 Jun 2004
55	200303713	22 Aug 2003	Accident	ZK-VAF	Darwin, Aerodrome	NT	09 Jun 2004
56	200402152	09 Jun 2004	Serious Incid.	VH-OGN	Jakarta/Soekarno-Hatta, Aerodrome	Other	17 Jun 2004
57	200401909	12 Feb 2004	Tech Analysis	–	Technical Analysis Investigation, Populated place	QLD	17 Jun 2004
58	200401866	23 May 2004	Accident	VH-JWG	Scott Creek Station	NT	17 Jun 2004
59	200401756	15 May 2004	Incident	VH-TAH/REG_2004	Sydney, Aerodrome	NSW	18 Jun 2004
60	200301941	01 May 2003	Serious Incid.	VH-SDE	Emerald, Aerodrome	QLD	18 Jun 2004
61	200300263	31 Jan 2003	Accident	RDPL-34141	Baucau, East Timor	Other	24 Jun 2004
62	200402232	16 Jun 2004	Incident	VH-OJT	Ildam, flight from Singapore (IFR)	Other	25 Jun 2004
63	200105618	27 Nov 2001	Accident	VH-LQH	Toowoomba, (ALA)	QLD	25 Jun 2004

Appendix 4: Transport safety recommendations and safety advisory notices issued in 2003–04

This appendix provides detailed information on the status of safety recommendations and safety advisory notices issued by the Australian Transport Safety Bureau in 2003–04.

Aviation

Under existing memoranda of understanding, both the Civil Aviation Safety Authority and Airservices Australia have agreed to respond to the ATSB within 60 days of the date of issue of any safety recommendations. No other organisations are obliged to respond but a nominal 60-day due date is listed and any response received is published.

On some occasions a response is voluntarily made to a draft safety output. This situation may result in a response date being prior to the formal issue date.

In 2003–04, the ATSB issued 46 recommendations (including one recommendation to multiple organisations) and 36 responses have been received. Of the responses, seven were closed-accepted, four were closed-partially accepted, 16 were being monitored, three remain open and six were closed not-accepted. The ATSB also issued two safety advisory notices to CASA for which the responses were closed-accepted.

Updated responses to prior year recommendations are available at the ATSB website. Responses from CASA and Aisservices that have the status Open or No Response are listed in Appendix 6.

Marine

Seventeen investigation reports completed in 2003–04 contained-safety recommendations that were released in 2003–04. There is no regulatory requirement for the shipping industry to respond to these.

Rail

The ATSB completed three rail investigation reports in 2003–04 at the request of state/territory authorities under state/territory legislation, two of which were released by the state authorities. While the Bureau provides the completed investigation report to these authorities, formal arrangements regarding responses torecommendations are a matter for the authorities concerned.

ATSB aviation recommendations issued in 2003–04

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20030056 The Australian Transport Safety Bureau recommends that Airservices Australia conduct a review to determine why flight crews were able to submit flight plans and operate on non-standard routes in contravention of the AIP, which required crews to plan on routes provided to the air traffic control system by the publication of air route specifications.	04 Aug 2003	Airservices Australia	03 Oct 2003 No response received	No Response
R20030057 The Australian Transport Safety Bureau recommends that Airservices Australia conduct a review to establish the extent of the use of non-standard levels in situations initiated by pilots and in situations initiated by controllers.	04 Aug 2003	Airservices Australia	03 Oct 2003 No response received	No Response
R20030058 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the Table of Cruising Levels in AIP and its continuing relevance.	04 Aug 2003	Civil Aviation Safety Authority	03 Oct 2003 Received 20 Oct 2003	Closed Not Accepted
R20030186 The Australian Transport Safety Bureau recommends that the United States Federal Aviation Administration, in conjunction with the manufacturer of the helicopter, the Robinson Helicopter Company, conduct a review of a representative sample of main rotor blade root fittings to establish the integrity of the adhesive bond in the spar to root fitting joint. The review should establish the extent of the loss of adhesion and the extent to which corrosion has infiltrated in the region of the inboard bolt hole of the blade root fitting. If possible, where disbonding is discovered, the operating history and in-service flight spectrum of the helicopter and the environmental conditions under which it operated should also be assessed.When completed, the results of the review should be forwarded to the ATSB for analysis as part of the ongoing accident investigation.	17 Sept 2003	Federal Aviation Administration (FAA)	16 Nov 2003 Received 08 March 2004	Open

Recommendation	Issue date	Receiving organisation	Date due/ received	Status of response
R20030186				
The Australian Transport Safety Bureau recommends that the United States Federal Aviation Administration, in conjunction with the manufacturer of the helicopter, the Robinson Helicopter Company, conduct a review of a representative sample of main rotor blade root fittings to establish the integrity of the adhesive bond in the spar to root fitting joint. The review should establish the extent of the loss of adhesion and the extent to which corrosion has infiltrated in the region of the inboard bolt hole of the blade root fitting. If possible, where disbonding is discovered, the operating history and in-service flight spectrum of the helicopter and the environmental conditions under which it operated should also be assessed.When completed, the results of the review should be forwarded to the ATSB for analysis as part of the ongoing accident investigation	17 Sept 2003	Robinson Helicopter Co	16 Nov 2003 No response received	No Response
R20030211				
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority mandate a one-off inspection of the Australian R22 fleet and if considered necessary, the R44 fleet to: a) inspect the A166 clutch shaft for evidence of fretting where it mates with the A907 yoke, and;b) inspect the shaft to yoke attachment bolt holes for fretting cracking or other wear, and;c) identify and remove paint from beneath the yoke assembly bearing block plate, and; d) identify and remove from service any instances of a non-approved mating compound on the A166 shaft to A907 yoke for the R22 fleet and the C166 shaft to C907 yoke for the R44 fleet.	06 Nov 2003	Civil Aviation Safety Authority	05 Jan 2004 Received 22 Dec 2003	Closed Accepted

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20030212 The Australian Transport Safety Bureau recommends that Helimuster (NT) carry out an inspection of the company R22 fleet and the company R44 fleet to: a) inspect the A166 clutch shaft for evidence of fretting where it mates with the A907 yoke, and;b) inspect the shaft to yoke attachment bolt holes for fretting cracking or other wear, and;c) identify and remove paint from beneath the yoke assembly bearing block plate, and; d) identify and remove from service any instances of a non-approved mating compound on the A166 shaft to A907 yoke for the R22 fleet and the C166 shaft to C908 yoke for the R44 fleet.	06 Nov 2003	Heli-Muster Pty Ltd	05 Jan 2003 Received 14 Nov 2004	Closed Accepted
R20030213 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review the night visual flight requirements and promulgate information to pilots emphasising the importance, during flight planning, of considering whether: environmental conditions allow for aircraft orientation by visual reference alone; there is likely to be sufficient ground or natural lighting and flight visibility along the proposed route to provide visual reference to the ground and/or water during the flight; and they are capable of safely operating the aircraft should non-visual conditions be encountered.	06 Nov 2003	Civil Aviation Safety Authority	05 Jan 2004 Received 10 Dec 2003	Monitor
R20030219 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in conjunction with the relevant industry associations, highlight the safety benefits to helicopter pilots and crew of the wearing of personal protective equipment, such as helmets and personal flotation devices when carrying out water-bombing in support of fire fighting operations, through safety promotion initiatives.	16 Dec 2003	Civil Aviation Safety Authority	14 Feb 2004 Received 06 Feb 2004	Monitor

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20030220 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in conjunction with the relevant industry associations, assess the desirability of a requirement for Helicopter Underwater Escape Training for specialist aerial work operations, such as water-bombing in support of fire fighting operations.	16 Dec 2003	Civil Aviation Safety Authority	14 Feb 2004 Received 06 Feb2004	Monitor
R20030221 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority consider advising Australian helicopter operators, involved in water-bombing in support of fire fighting operations, of the need to review the type of fire-buckets used to ensure that they comply with the bucket manufacturer's guidance for use on helicopter types and to ensure that they are appropriately maintained.	16 Dec 2003	Civil Aviation Safety Authority	14 Feb 2004 Received 06 Feb 2004	Monitor
R20040013 The ATSB recommends that the Civil Aviation Safety Authority, in consultation with Airservices Australia and the NAS Implementation Group, review NAS procedures and communications requirements for operations in Class E airspace, with particular emphasis on air transport operations during climb and descent in non-radar airspace, with a view to enhancing situational awareness of pilots operating in that airspace. The review should include examination of, and where necessary revision and updating of, education, training and chart frequency material.	15 Jan 2004	Civil Aviation Safety Authority	15 Mar 2004 Received 17 Feb 2004	Monitor

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20040014				
The ATSB recommends that Airservices Australia, in consultation with the Civil Aviation Safety Authority and the NAS Implementation Group, review NAS procedures and communications requirements for operations in Class E airspace, with particular emphasis on air transport operations during climb and descent in non-radar airspace, with a view to enhancing situational awareness of pilots operating in that airspace. The review should include examination of, and where necessary revision and updating of, education, training and chart frequency material.	15 Jan 2004	Airservices Australia	15 Mar 2004 Received 20 Jan 2004	Monitor
R20030179				
The Australian Transport Safety Bureau recommends that Regional Express note the circumstances of the above incident where Saab 340 aircraft can stall without warning in icing conditions and alert their flight crew accordingly.	20 Jan 2004	Regional Express Airlines	20 Mar 2004 No response	No Response
R20030181				
The Australian Transport Safety Bureau recommends that Macair note the circumstances of the above incident where Saab 340 aircraft can stall without warning in icing conditions and alert their flight crew accordingly.	20 Jan 2004	Macair Airlines Pty Ltd	20 Mar 2004 No response	No Response
R20030182				
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority examine the circumstances surrounding this incident where Saab 340 aircraft can stall without warning in icing conditions and take appropriate action to ensure the safety of the Saab 340 fleet operating within Australia.	20 Jan 2004	Civil Aviation Safety Authority	20 Mar 2004 Received 25 Feb 2004	Monitor

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20030183				
The Australian Transport Safety Bureau recommends that, as a matter of priority, Saab Aircraft AB modify the stall warning system of the worldwide fleet of Saab 340 aircraft to give sufficient warning of an impending stall to crews during flight in icing conditions.	20 Jan 2004	Saab Aircraft AB	20 Mar 2004 Received 27 Mar 2004	Open
R20030180				
The Australian Transport Safety Bureau recommends that Hazelton Airlines note the circumstances of the above incident where Saab 340 aircraft can stall without warning in icing conditions and alert their flight crew accordingly.	28 Jan 2004	Hazelton Air Services Pty Limited	28 Mar 2004	No Response
R20030007				
'The Australian Transport Safety Bureau recommends that all Australian Saab 340 operators review the design of the Saab 340 abnormal and emergency checklists, with reference to current human factors research findings on the design and use of aircraft checklists.	26 Jan 2004	SAAB 340 Operators	26 Apr 2004	No Response
R20030008				
The Australian Transport Safety Bureau recommends that Saab Aircraft AB redesign the Saab 340 abnormal and emergency checklists to improve usability, with reference to current human factors research findings on the use and design of aircraft checklists.	26 Feb 2004	SAAB Aircraft AB	26 Apr 2004 Received 18 Aug 2004	Monitor

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20030009 The Australian Transport Safety Bureau recommends that the Aviation safety Authority of Sweden (Luftfartsverket) review the design of the Saab 340 abnormal and emergency checklists with reference to current human factors research findings on the design and use of aircraft checklists.	26 Feb 2004	Luftfartsverket	26 Apr 2004	No Response
R20030010 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review their existing approvals of the Saab 340 abnormal and emergency checklists, with reference to current human factors research findings on the design and use of aircraft checklists.	26 Feb 2004	Civil Aviation Safety Authority	26 Apr 2004 Received 10 Mar 2004	Closed-Partially Accepted
R20030013 The Australian Transport Safety Bureau recommends that all Australian Saab 340 operators assess the safety benefit of implementing Saab Aircraft AB Service Bulletin 340-24-026 incorporating generator control unit modification number 2533.	26 Feb 2004	SAAB 340 Operators	26 Apr 2004	No Response
R20030014 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority assess the safety benefit of mandating Saab Aircraft AB Service Bulletin 340-24-026 incorporating generator control unit modification number 2533.	26 Feb 2004	Civil Aviation Safety Authority	26 Apr 2004 Received 10 Mar 2004	Closed- Not Accepted

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20030015 The Australian Transport Safety Bureau recommends that the Aviation safety Authority of Sweden (Luftfartsverket) assess the safety benefit of mandating Saab Aircraft AB Service Bulletin 340-24-026 incorporating generator control unit modification number 2533.	26 Feb 2004	Luftfartsverket	26 Apr 2004 Received 08 Jul 2004	Monitor
R20030016 The Australian Transport Safety Bureau recommends that the Federal Aviation Administration assess the safety benefit of mandating Saab Aircraft AB Service Bulletin 340-24-026 incorporating generator control unit modification number 2533.	26 Feb 2004	Federal Aviation Administration (FAA)	26 Apr 2004	No Response
R20030018 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review their existing approvals of Saab 340 systems of maintenance to ensure continued consistency with maintenance review board report requirements for the Saab 340.	26 Feb 2004	Civil Aviation Safety Authority	26 Apr 2004 Received 23 Mar 2004	Closed-Accepted
R20030230 The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority issue advisory information to all pilots, restating the information contained in United States of America Federal Aviation Administration Advisory Circular AC 20-113 pertaining to aircraft engine induction system icing.	01 Mar 2004	Civil Aviation Safety Authority	30 Apr 2004 Received 03 May 2004	Monitor

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20040039 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, in conjunction with the Department of Transport and Regional Services, establish the safety benefits of the introduction of a drug and alcohol testing program to the Australian aviation industry for safety-sensitive personnel. Where possible, this program should harmonise with existing and evolving national and international regulations.	18 Mar 2004	Civil Aviation Safety Authority	17 May 2004 Received 28 May 2004	Closed-Accepted
R20040040 The Australian Transport Safety Bureau recommends that the Department of Transport and Regional Services, in conjunction with the Civil Aviation Safety Authority, establish the safety benefits of the introduction of a drug and alcohol testing program to the Australian aviation industry for safety-sensitive personnel. Where possible, this program should harmonise with existing and evolving national and international regulations.	18 Mar 2004	Department of Transport and Regional Services	17 May 2004 Received 01 June 2004	Closed-Accepted
R20040041 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority revise the content of the pilot Day VFR Syllabi to include contemporary aviation medical knowledge regarding the effects of alcohol and illicit drugs use on human performance, and disseminate that information to qualified pilots via a comprehensive education program.	18 Mar 2004	Civil Aviation Safety Authority	17 May 2004 Received 28 May 2004	Closed-Accepted
R20040042 The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review their Safety Trend Indicator process, including with a view to developing a methodology to assist in objectively assessing potential at-risk organisations. That should include formal 'triggers' that enable the consistent prediction of the requirement for additional surveillance until CASR Part 119 takes full effect.	18 Mar 2004	Civil Aviation Safety Authority	17 May 2004 Received 28 May 2004	Closed-Partially Accepted

Recommendation	Issue date	Receiving organisation	Datu due / received	Status of response
SAN20040043				
The ATSB suggests that CASA, through its industry publications, inform operators and pilots of Cherokee Six aircraft that a fuel selector control visual indication might not ensure selection of the intended fuel tank. In that case, actual fuel tank selection may be incorrect or partial, and result in the possibility for inconsistent engine fuel supply. Pilots should confirm correct visual fuel tank selection by detent feel.	18 Mar 2004	Civil Aviation Safety Authority	17 May 2004 Received 28 May 2004	Closed- Accepted
SAN20040044				
The ATSB suggests that CASA, through its industry publications, should inform operators that a pilot's induction program should reflect the risks inherent in the proposed operation, and take account of the pilot's competencies, recency and proficiency relative to those risks.	18 Mar 2004	Civil Aviation Safety Authority	17 May 2004 Received 28 May 2004	Closed- Accepted
R20040054				
The ATSB recommends that the Civil Aviation Safety Authority review MAF Aviation Services Engineering Order 0071-001 E1 and the cadmium plating and baking process controls employed by the plating subcontractor to determine if the process and process controls prevent the occurrence of hydrogen-induced delayed cracking in high-strength steel engine through-bolt nuts.	29 Mar 2004	Civil Aviation Safety Authority	28 May 2004 Received 13 Aug 2004	Closed- Accepted

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20040056 The Australian Transport Safety Bureau recommends that Airservices Australia estimate the overall midair collision risk at major general aviation airports (Archerfield, Bankstown, Jandakot, Moorabbin and Parafield) and compare these estimated risk levels with relevant acceptable risk criteria.	04 May 2004	Airservices Australia	03 Jul 2004 Received 29 Jun 2004	Monitor
R20040057 The Australian Transport Safety Bureau recommends that CASA develop formal advisory material for pilots, based on relevant research and publications, about collision risk management strategies. This formal guidance material should include, but not necessarily be limited to, information on visual scanning techniques, situations where visual scanning is most important, other techniques to increase the likelihood of detecting other aircraft, types of spectacles and sunglasses best suited for aviation tasks, and collision avoidance manoeuvres.	04 May 2004	Civil Aviation Safety Authority	03 Jul 2004 Received 5 Jul 2004	Monitor
R20040052 The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority assess the safety benefits of requiring a standby attitude indicator, with an independent power source, in all helicopters operating flights under the NVFR in the Charter and Aerial Work category, excluding dual pilot training.	12 May 2004	Civil Aviation Safety Authority	11 Jul 2004 Received 21 Jul 2004	Monitor
R20040053 The Australian Transport Safety Bureau recommends that the Australian Civil Aviation Safety Authority assess the safety benefits of requiring an autopilot or stability augmentation system in all single pilot helicopter operating flight under the NVFR, in the Charter and Aerial Work category, excluding dual pilot training.	12 May 2004	Civil Aviation Safety Authority	11 Jul 2004 Received 21 Jul 2004	Monitor

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20040058				
The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority assess the safety benefit of mandating Cessna Alert Bulletin CAB01-15 with regard to the Emergency Power Lever on all Approved Single Engine Turbine Powered Aeroplane Australian registered C208 aircraft.	12 May 2004	Civil Aviation Safety Authority	11 Jul 2004 Received 14 Jul 2004	Monitor
R20040062				
The Australian Transport Safety Bureau recommends that Airservices Australia review the effectiveness of its check and training program in the area of procedural control services.	07 Jun 2004	Airservices Australia	06 Aug 2004 Received 23 Jul 2004	Open
R20040063				
The Australian Transport Safety Bureau recommends that Airservices Australia review the MATS amendment decision that removed the mandatory requirement to provide traffic information to aerodrome traffic.	07 Jun 2004	Airservices Australia	06 Aug 2004 Received 23 Jul 2004	Monitor
R20040064				
The ATSB recommends that CASA conduct a national review of the level of operator compliance with the requirements of mandatory turbine engine condition monitoring programs, particularly for passenger carrying operations.	25 Jun 2004	Civil Aviation Safety Authority	24 Aug 2004 Received 23 Aug 2004	Closed- Accepted

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20040065 The ATSB recommends that CASA review its surveillance processes to ensure that, during future surveillance activities, priority is given to confirming operator compliance with the requirements of mandatory turbine engine condition monitoring programs, particularly for passenger carrying operations.	25 Jun 2004	Civil Aviation Safety Authority	24 Aug 2004 Received 23 Aug 2004	Closed- Partially Accepted
R20040066 The ATSB recommends that CASA review its airworthiness surveillance processes and Certificate of Approval assessment processes to ensure that it provides adequate guidelines to assist CASA inspectors to identify priority areas for consideration during surveillance and approval activities, such as programs for compliance with the requirements of Airworthiness Directives.	25 Jun 2004	Civil Aviation Safety Authority	24 Aug 2004 Received 23 Aug 2004	Closed- Not Accepted
R20040067 The ATSB recommends that CASA review its airworthiness surveillance processes and Certificate of Approval assessment processes to ensure that it provides specific guidelines to assist CASA inspectors to assess whether a maintenance organisation has adequate personnel resources to conduct its required activities.	25 Jun 2004	Civil Aviation Safety Authority	24 Aug 2004 Received 23 Aug 2004	Closed- Not Accepted
R20020068 The ATSB recommends that CASA consider providing formal advisory material for operators and pilots, based on relevant research and publications, about managing engine failures and other emergencies during takeoff in multi-engine aircraft below 5,700 kg MTOW. This material should include the factors to be considered by operators when developing procedures for responding to such emergencies.	25 Jun 2004	Civil Aviation Safety Authority	24 Aug 2004 Received 23 Aug 2004	Closed- Not Accepted

Recommendation	Issue date	Receiving organisation	Datu due/ received	Status of response
R20040069				
The ATSB recommends that CASA consider and evaluate options to improve the suitability of industry practices for training pilots to make appropriate decisions when responding to engine failures and other emergencies during critical phases of flight in multi-engine aircraft below 5,700 kg MTOW. This review should include an assessment of the suitability of utilising synthetic training devices for the purpose of training pilots to make decisions regarding emergencies.	25 Jun 2004	Civil Aviation Safety Authority	24 Aug 2004 Received 23 Aug 2004	Closed- Partially Accepted
R20040070				
The ATSB recommends that the Toowoomba City Council liaise with CASA to evaluate an engineering solution to enhance aircraft deceleration in the runway end safety area of runway 11/29 at Toowoomba aerodrome.	25 Jun 2004	Toowoomba City Council	24 Aug 2004	No Response

ATSB marine recommendations issued in 2003–04

Recommendation	Date of issue
Independent investigation into the crew fatality on the Panama flag vessel Taharoa Express at Dampier, Western Australia on 11 July 2002.	26 Aug 2003
MR20030025 ISM documentation for harbour stations should include appropriate procedures from the ILO publication 'Accident prevention on board ship at sea and in port' to assist seafarers to operate safely during anchoring, mooring or towing operations.	
MR20030026 For port operators: With mooring equipment being critical to the safety of ships in port, modifications to such equipment should be referred to the manufacturers of the equipment. In addition, after any modification, the equipment should be examined and tested for correct functioning.	
MR20030027 For port operators: A thorough investigation of the modifications to the remote release mechanisms for mooring hooks should be undertaken to ensure that the hooks operate safely and reliably.	
MR20030028 For port operators: Regular maintenance and testing of mooring equipment should be carried out and recorded.	
Independent investigation into the fire onboard the Panama flag vessel Captain Aysuna in Bass Strait on 8 October 2001.	26 Aug 2003
MR20030029 Ships' personnel should be made fully aware of the precautions necessary to prevent fires in machinery spaces - in particular, the maintenance of clean conditions, the prevention of oil leakage and the removal of all combustible materials from vulnerable positions.	
MR20030030 Ships' personnel should note that wood, paints, spirits and tins or containers of oil should not be kept in boiler rooms or machinery spaces.	
MR20030031 Shipowners, managers and operators should ensure that their crews are encouraged to cooperate with investigatory authorities to promote safety at sea and prevent the recurrence of incidents and accidents.	

Recommendation	Date of issue
Independent investigation into the disabling of the Antigua/Barbados flag vessel ANL Purpose in the Tasman Sea on 6 August 2001.	05 Sept 2003
MR 20030024 That Wärtsilä-NSD consider issuing a service letter to owners of VASA 32 engines advising that the Wärtsilä Service Letter (Document no. 3204N026GB) dated 25 November 1997 'Main components' maintenance intervals for VASA 32, 32LN and 32 GD' should also apply to any one-piece, or 'monobloc' pistons still in service or provide other appropriate service guidance.	
Independent investigation into the grounding of the Greek Flag vessel Doric Chariot on the Great Barrier Reef on 25 September 2003.	25 Sept 2003
MR20030032 Ships' officers should ensure that they fully understand any intentions and instructions that they are given by a pilot prior to accepting 'active' conduct from them. Pilots must ensure that they are satisfied that ship's officers fully understand the pilot's intentions. Pilots and ships' officers should both ensure that any handover of responsibility is unambiguous and complete.	
MR20030033 The Great Barrier Reef pilotage services should consider adopting a fatigue management policy that predicts potential fatigue levels at key positions in the pilotage task. Rather than only examining a pilots fatigue level after a passage, the pilotage provider should, prior to allocating the job, use the FAID program to ensure that a reasonable projection of the pilot's fatigue score would not exceed a predetermined value at any point during the pilotage.	
MR20030034 Australia should submit a paper to the IMO seeking to amend the performance criteria of GPS sets to include distinctive alarms and indicators. Such alarms, when silenced, should automatically annunciate again after a specific time period, unless the GPS is reprogrammed or the alarm condition ceases.	
Independent investigation into the crew fatality onboard the Panama flag vessel Golden Bridge south of Norah Head, New South Wales on 10 December 2002.	25 Sept 2003
MR20030035 Senior ship's officers should ensure that any new staff are adequately instructed and supervised during their initial stages on board a ship especially in procedures specific to that vessel where written procedures for ship specific operations are not available.	
MR20030036 Ship staff should review their written procedures and job safety analysis to ensure that all 'critical shipboard tasks' have procedures written to detail the correct procedure for safe completion.	

Recommendation	Date of issue
Independent investigation into the fire onboard the Dutch flag vessel Marion Green off the south coast of Western Australia on 28 July 2002.	09 Dec 2003
MR20030037 That Beluga Genchart BV take measures to ensure that a strict 'no smoking' policy in the vicinity of cargo operations is enforced on board their vessels.	
MR20030038 That Beluga Genchart BV ensure that ship's masters are provided with all relevant information regarding the stowage of cocoa beans, their fumigation and any associated hazards. As a minimum, the IMO's 'Recommendations on the safe use of pesticides in ships' should be available on board any ship loading a fumigated cargo.	
MR20030039 That shippers, stevedores and ship's officers should all ensure that, when bagged cocoa bean or other organic cargoes are being loaded, adequate ventilation channels are provided and that cargo is stacked with sufficient 'cross ties' to ensure that the channels remain clear during the voyage.	
MR20030040 That Beluga Genchart BV take measures to ensure that, on completion of loading cargoes, the deck watchkeeping officer makes an entry in the deck logbook confirming that all electrical equipment in the holds has been isolated and stowed as applicable.	
Independent investigation into the foundering of the Australian fishing vessel Tamara 150nm off the Queensland coast on 1 September 2002.	09 Dec 2003
MR20030041 State and Northern Territory marine authorities should review their practicesre-lating to the scrutiny of commercial vessels changing registration status.	
MR20030042 State and Northern Territory marine authorities should ensure that there is clearguidance available regarding position reporting arrangements for non-SOLASvessels proceeding on long coastal or overseas voyages.	
MR20030043 State and Northern Territory marine authorities, through the forum of the National Marine Safety Committee, should review the service provided by the Marine HF Radio Network to non-SOLAS vessels to determine the practicality of including a regular position reporting system.	
MR20030044 Vessel owners, operators and responsible marine authorities should seriously consider the issue of EPIRB siting to ensure that EPIRBs are readily available in an emergency and give consideration to the fitment of float free EPIRBs on commercial vessels.	
MR20030045 Consideration should be given by State and Northern Territory marine authorities as to whether 'coastal' liferafts should be required to carry parachute flares.	

Recommendation	Date of issue
Independent investigation into the grounding of the South Korean flag vessel Hanjin Dampier at Dampier, Western Australia on 25 August 2002.	22 Dec 2003
MR20030046 Ship owners/managers should review the procedures for, and frequency of, testing emergency power generation arrangements on their ships to ensure that this equipment has the highest possible reliability and availability.	
MR20030047 Ship owners/managers should consider bridge resource management training for engineering officers.	
MR20030048 Hamersley Iron should review the risks associated with the navigation of outbound deep draught ships, particularly in the Hamersley Channel, and consider extending tug escort times.	
Independent investigation into the collision between the Samoan flag vessel Forum Samoa II and the Australian fishing vessel Sea Breeze off Cape Moreton, Queensland on 11 April 2002.	22 Dec 2003
MR20030049 Shipowners, managers and masters of ships ensure that the requirements for a proper lookout are understood and practised by bridge watchkeepers.	
MR20030050 Owners, operators and skippers of fishing vessels or sailing or other small craft ensure that a proper lookout is maintained at all times when a vessel is at sea. The requirement for a proper lookout exists whether or not a fishing vessel is engaged in fishing.	
Independent investigation into the collision between the Panama flag vessel Star Sea Bridge and the Australian fishing vessel Sue M off Evans Head, New South Wales on 21 June 2000.	26 Feb 2004
MR20040001 Ships' masters and skippers of fishing vessels ensure that, in accordance with the Collision Regulations, a proper lookout is maintained at all times.	
MR20040002 Ships' masters and watchkeepers, skippers and crews of fishing vessels take note of the limitations of radar and the fact that radar detection of small wooden vessels is likely to occur at smaller ranges than for similar vessels with steel hulls.	
MR20040003 Owners, operators and skippers of fishing vessels consider the use of appropriate equipment to improve the radar detectability of their vessels.	

Recommendation	Date of issue
MR20040004 Fishing vessel owners and operators note that low manning levels of their vessels can lead to crews being unable to keep a proper lookout.	
MR20040005 The National Marine Safety Committee in conjunction with State marine authorities consider making IMO approved types of radar reflectors mandatory on commercial fishing vessels.	
MR20040006 EPIRBs and other lifesaving equipment on fishing vessels and small craft be carried outside the wheelhouse, readily available for use when at sea.	
Independent investigation of the explosion onboard the Panama flag vessel Medi Monaco at Geelong, Victoria on 17 May 2003.	03 May 2004
MR 20040007 The Osaka Boiler Mfg Company provide a safety bulletin to operators of OEVC2 boilers warning them of the incidents on Medi Monaco and Alam Mesra and drawing their attention to the correct safety precautions when servicing the fuel burner unit.	
Independent investigation into the collision of the Malaysian flag vessel Bunga Orkid Tiga and the Australian fishing vessel Stella 7 near Creech Reef, Great Barrier Reef on 5 January 2004.	14 June 2004
MR20040008 Shipowners, managers and masters of ships ensure that the requirements contained in the Colregs for keeping a proper lookout are understood and practised by watchkeepers.	
MR20040009 Owners, operators and skippers of small fishing boats, or sailing and other small craft ensure that a proper lookout is maintained by a suitably qualified and trained person at all times when a vessel is at sea, in accordance with the Colregs. The requirement for a proper lookout exists whether or not a fishing vessel is engaged in fishing.	
MR20040010 State and Territory marine authorities, through the National Marine Safety Committee, review fishing boat crew certification training arrangements to ensure that any person who is required to stand a navigation watch at sea has training in the use of radar as a collision avoidance aid and that the person be properly trained in the requirements contained in the Colregs for establishing risk of collision and collision avoidance.	
MR20040011 State and Territory marine authorities, through the National Marine Safety Committee, review the availability and effectiveness of radar reflectors, with a view to increasing the early detection of small vessels by larger trading ships.	

Recommendation	Date of issue
Independent investigation into the crew fatality onboard the Hong Kong flag vessel Yu Long Shan at anchor off Hay Point, Queensland on 11 March 2004.	14 June 2004
MR20040012 Shipping companies, managers and ships' masters should review ISM documentation to ensure that procedures for working in hazardous locations are adequately and unambiguously covered. These include: • The wearing of appropriate foot coverings and gloves; • Safety belts or harnesses being secured to a strong point; and • The importance of concentrating on the task at hand.	
Independent investigation into the lifeboat accident onboard the Hong Kong flag vessel Ma Cho at Devonport, Tasmania on 9 December 2002.	30 June 2004
MR20040013 It is recommended that Qingdao Beihai Shipyard review the design of their BG-3 onload release system in respect of the hook locking mechanism in light of the incident aboard Ma Cho.	
MR20040014 It is recommended that classification societies issuing approvals for on-load release systems review the in-service safety of designs with hook locking mechanisms using the same principle as that used on Ma Cho's lifeboats.	
MR20040015 It is recommended that all ISM Code accreditation authorities ensure that the safety management systems on all vessels fitted with on-load release equipment provide adequate safeguards to mitigate the significant risks of operating and maintaining these systems.	
Independent investigation into the crew fatality onboard the Hong Kong flag vessel Pacific Wisdom at Albany, Western Australia on 7 September 2003.	30 June 2004
MR20040016 The shipping company's ISM procedures should be amended to specifically cover working with scaffolding.	
MR20040017 Responsible persons should ensure that the height to base ratio of a scaffold should not exceed 3 to 1 without guy ropes or preventers in place prior to use. Wheels must be locked before anyone is permitted aloft.	
MR20040018 The various responsible bodies in the Port of Albany should regularly consult so as to identify all the risks in common and to efficiently coordinate their responses.	

Recommendation	Date of issue
Independent investigation into the grounding of the Panama flag vessel La Pampa in the port of Gladstone, Queensland on 27 March 2002.	30 June 2004
MR 20040019 Port authorities consider the risks associated with the passage of deep draught vessels within their ports and have appropriate contingency plans in place to deal with foreseeable emergencies.	
Independent investigation into the grounding of the Liberian flag vessel Pactrader at Thevenard, South Australia on 1 March 2003.	30 June 2004
MR20040020 Flinders Ports should undertake a risk assessment of the Port of Thevenard, taking into account the variable environmental factors, together with infrastructure and pilotage ongoing training experience issues.	

ATSB rail recommendations issued in 2003–04

Recommendation	Date of issue	Target organisation
Collision between 'runaway' train and stationary train at Spencer Street Station, Melbourne on 3 February 2003		
Victorian Department of Infrastructure	11 Mar 2003	Victorian Department of Infrastructure
RR20030001 The ATSB recommends that the Department of Infrastructure monitor progress of engineering proposals and programs aimed at interconnecting the park brake when the driver's controls are isolated.		
RR20030002 The ATSB recommends that the Department of Infrastructure monitor the recommended revision of procedures for changing ends on Comeng suburban electric trains.		
RR20030003 The ATSB recommends that the Department of Infrastructure monitor progress aimed at improving voice communication and visual indications across the Melbourne suburban network.		
RR20030004 The ATSB recommends that the Department of Infrastructure monitor the review of radio protocols, particularly those related to emergency situations.		
RR20030005 The ATSB recommends that the Department of Infrastructure monitor progress in relation to the recommended overhaul of brake and foot pilot valve equipment on Comeng suburban electric trains.		
RR20030006 The ATSB recommends that the Department of Infrastructure monitor progress in relation to the recommended amendment of, and training in, the 'Emergency Response Plan Trains Division'.		
RR20030007 The ATSB recommends that the Department of Infrastructure evaluate recommendations contained in this report that may be relevant to other operators onthe Melbourne suburban network. Bayside Trains Pty Ltd, Receiver Manager Appointed (R.M.A.)		

Recommendation	Date of issue	Target organisation
Bayside Trains Pty Ltd, Receiver Manager Appointed (R.M.A.) RR20030008 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. undertake modification of all Comeng suburban electric trains to ensure that the park brake is automatically applied whenever the driver's controls are isolated. RR20030009 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. consolidate the duties to be performed by a driver when changing ends on a suburban electric train into one procedure. RR20030010 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. ensure that these consolidated changing ends duties mandate the application of the park brake on suburban trains whenever the driver vacates the driver's cabin. RR20030011 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. ensure that instructionsare issued that mandate the reduction of the brake pipe to atmospheric air pressure (zero as indicated on the gauge) before cutting the driver's brake valve out. This instruction to be included in the consolidated changing ends procedure. RR20030012 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. conduct periodical audits of drivers to ensure consistency of drivers' actions when changing ends on suburban electric trains. RR20030013 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. standardise the position of the 'on' and 'off ' park brake buttons in the driver's cabin of Comeng suburban electric trains. RR20030014 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. undertake a critical examination of voice communication media across its Melbourne suburban network.	11 Mar 2003	Bayside Trains Pty Ltd, Receiver Manager Appointed

Recommendation	Date of issue	Target organisation
RR20030015 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. undertake a review of radio protocols, particularly those related to emergency situations.	11 Mar 2003	Bayside Trains Pty Ltd, Receiver Manager Appointed
RR20030016 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. assess the viability of expanding the visual indications afforded to Metrol control officers from its current boundary in the Kensington precinct to Broadmeadows Station.		
RR20030017 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. provide basic training to Metrol officers in the characteristics of suburban electric trains and other forms of rolling stock as deemed necessary.		
RR20030018 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. undertake a review of the rosters of operational personnel with the aim of minimising roster induced fatigue. (While the investigation centred on the FAID score at the time of the emergency, this recommendation is based on the projected FAID scores of the controller and signaller and the conclusion of their roster sequences.)		
RR20030019 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. consider maintenance scheduling in regard to brake equipment on Comeng suburban electric trains.		
RR20030020 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. institute a maintenance and overhaul program for the driver's foot pilot valve on the Comeng suburban electric trains.		
RR20030021 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. amend the 'Emergency Response Plan Trains Division' to incorporate generic guidelines for dealing with a runaway train.		
RR20030022 The ATSB recommends that Bayside Trains Pty Ltd, R.M.A. institute employee training in regard to the 'Emergency Response Plan Trains Division'.		

Recommendation	Date of issue	Target organisation
Fatal collision between a passenger train and a vehicle at a rail level crossing accident at Aloomba, Queensland on 23 May 2003 In accordance with the requirements of the Level Crossing Upgrade Program, the Hesp Road/Bennett Road level crossing be re-assessed in light of this report and the proposals to meet the risk threshold and compliance implemented as a matter of priority.	09 Dec 2003	Queensland Rail
Collision between a freight train and a passenger train at Chiltern, Victoria on 16 February 2003 RR200300023 The ATSB recommends that the Department of Infrastructure review all accredited organisation's SMS provisions for the maintenance standards of wheel bearings. Particularly to the maximum bore size of bearings, the minimum journal diameter, storage life and procedures for extending effective service life of the bearing. RR200300024 The ATSB recommends that the Department of Infrastructure monitor the review of communications technologies between Train Control centres.	Expected Oct 2004	Victorian Department of Infrastructure
RR200300025 The ATSB recommends that Pacific National review rolling stock maintenance schedules to include distance and time based criteria. RR200300026 The ATSB recommends that Pacific National ensure that stored bearings, separate or mounted, are serviced as recommended by the manufacturer. RR200300027 The ATSB recommends that Pacific National review the procedures for rolling stock, bogies, or wheelsets entering service after extended periods of storage or inactivity. RR200300028 The ATSB recommends that Pacific National review training procedures for the use of radio equipment during an emergency.		Pacific National

Recommendation	Date of issue	Target organisation
RR200300029 The ATSB recommends that Freight Australia review communications technologies to allow for greater reliability between other Train Control centres during emergencies. RR200300030 The ATSB recommends that Freight Australia review communications procedures with other Train Control centres during emergencies on shared railway corridors.		Freight Australia
RR200300031 The ATSB recommends that the Australian Rail Track Corporation review communications technologies to allow for greater reliability between other Train Control centres during emergencies. RR200300032 The ATSB recommends that the Australian Rail Track Corporation review communications procedures with other Train Control centres during emergencies on shared railway corridors.		Australian Rail Track Corporation
RR200300033 The ATSB recommends that the Australasian Railway Association consider the implementation of minimum maintenance standards for packaged and boxed axle bearings.		Australasian Railway Association Inc

Appendix 5: ATSB investigations underway at 30 June 2004

Rail investigations underway at 30 June 2004

Occurrence date	Location	Description
13 Oct 2002	Benalla, Vic.	Collision at a level crossing between a special charter passenger train and a B-double truck
09 Nov 2003	Bates, SA	Derailment of a freight train
28 Nov 2003	Ararat, Vic.	Derailment of a freight train
25 Feb 2004	Sandgate, NSW	Near head-on collision of a freight train with an empty passenger train
15 Mar 2004	Alumatta, Vic.	Derailment of a freight train
28 June 2004	Murarrie, Qld	Signal Passed At Danger (SPAD) incident

Marine investigations underway at 30 June 2004

Vessel	Incident date	Type	Occurrence and location
Maersk Tacoma	08 Aug 2001	Container ship	Disabled in Bass Strait
*Goliath**	22 Sep 2002	Bulk cement ship	Machinery damage, Bass Strait
Tauranga Chief	17 Jan 2003	Semi-container ship	Grounding at Bradleys Head, Sydney
*Goliath**	12 Feb 2003	Bulk cement ship	Machinery damage SE of Jervis Bay, NSW
Searoad Mersey	21 Mar 2003	Roll on-roll off cargo ship	Machinery damage in Bass Strait
Asian Nova/F.V. Sassenach	29 May 2003	Bulk carrier/ fishing vessel	Collision off Palm Islands, Qld
Lancelot/FV Jenebar	21 Aug 2003	Bulk carrier/ fishing vessel	Collision off Forster, Central NSW coast
Port Arthur	20 Oct 2003	Product tanker	Lifeboat accident in Port Botany
Astor	26 Feb 2004	Passenger ship	Grounding in Platypus Channel, Townsville
Harmonic Progress	16 Apr 2004	Bulk carrier	Machinery damage at sea, south of Lihou Reef (Coral Sea)

* *The two GOLIATH incidents are counted as a single investigation and will feature in a single investigation report.*

Aviation investigations underway at 30 June 2004

Date of occurrence	Investigation category	Manufacturer	Aircraft model	Location
07 Aug 2002	4	Saab Aircraft AB	SF340B	37km WSW Sydney, Aerodrome, NSW
08 Dec 2002	3	Boeing Co	767-219ER	56km ESE Brisbane, Aerodrome, Qld
15 Dec 2002	4	Boeing Co	737-476	Canberra, Aerodrome, ACT
01 Jan 2003	4	Boeing Co	767-338ER	Satna, (IFR), (Nth of Darwin)
16 Jan 2003	4	Boeing Co	737-7BX	Sydney, Aerodrome, NSW
16 Jan 2003	4	Saab Aircraft AB	SF-340B	Orange, Aerodrome, NSW
07 Feb 2003	3	Beech Aircraft Corp	76	Camden, Aerodrome, NSW
19 Feb 2003	3	Boeing Co	737-376	Darwin, Aerodrome, NT
21 Feb 2003	4	Cessna Aircraft Company	441	Lake Johnston, Named feature, WA
13 Mar 2003	4	Saab Aircraft AB/Aerospatiale	SF-340B/AS.350B2	19km WSW Sydney, VOR, NSW
13 Mar 2003	4	Gates Learjet Corporation	45	Brisbane, Aerodrome, Qld
29 Mar 2003	4	Amateur Built Aircraft	Canadian Safari	4km SW McLaren Vale, SA
15 Mar 2003	3	Raytheon Aircraft	Beech Super King Air B200C	6km NE Coffs Harbour, Aerodrome, NSW
29 Mar 2003	3	Boeing Co	717-200	13km NNW Mackay, Aerodrome, Qld
20 June 2003	3	Robinson Helicopter Co	R22 Mariner	13km NW Camden, Aerodrome, NSW
22 June 2003	4	Cessna Aircraft Company	172M	Wedderburn, (ALA), NSW
01 July 2003	2	High power reciprocating engines	–	Technical Analysis Investigation
01 July 2003	4	Boeing Co	747-438	Technical Analysis Investigation

Note: Statistics on numbers of aviation investigations instigated, released and underway may vary over time due to factors including reclassifications and discontinuations.

Date of occurrence	Investigation category	Manufacturer	Aircraft model	Location
01 July 2003	4	Boeing Co	727-277	Technical Analysis Investigation
01 July 2003	3	–	–	Technical Analysis investigation, CFM 56 #4 Bearing Failures
02 July 2003	3	Boeing Co	747-438	Sydney, Aerodrome, NSW
11 Aug 2003	3	Cessna Aircraft Company	404	Jandakot, Aerodrome, WA
15 Aug 2003	4	Victa Ltd	Airtourer 100/A3	1.45km W Camden, Aerodrome, NSW
17 Aug 2003	4	Bell Helicopter Co	204B	Near Lake Bonaparte, British Columbia
21 Aug 2003	4	Piper Aircraft Corp	PA-31-350	28km N Bankstown, Aerodrome, NSW
24 Aug 2003	4	Airbus	A330-341	Sydney, Aerodrome, NSW
06 Sept 2003	4	de Havilland Canada	DHC-8-102	Brisbane, Aerodrome, Qld
28 Sept 2003	3	Robinson Helicopter Co	R22	93km S Derby, WA
01 Oct 2003	3	Piper Aircraft Corp	PA-23-250	1km WSW Mareeba, Aerodrome, Qld
01 Oct 2003	4	Bell Helicopter	206B	40km E Armidale, NDB, NSW
15 Oct 2003	3	Convair	Convair 580	Tech Analysis - 580 ZK-KFU - Convair 580 in-flight break-up for NZ TAIC
17 Oct 2003	3	Bell Helicopter Co	407	28km N Mackay, Aerodrome, Qld
26 Oct 2003	4	Boeing Co	767-238	Coolangatta, Aerodrome, Qld
08 Nov 2003	3	Robinson Helicopter Co	R44	43km NW Kununurra, Aerodrome, WA
11 Nov 2003	3	Piper Aircraft Corp	PA-34-200	Bankstown, Aerodrome, NSW
17 Nov 2003	4	Boeing Co	747-438	Singapore, Changi, Aerodrome

Date of occurrence	Investigation category	Manufacturer	Aircraft model	Location
25 Nov 2003	3	Boeing Co	747-338	Narita Airport, Japan
27 Nov 2003	4	de Havilland Canada	DHC-8-202	Brisbane, Aerodrome, Qld
30 Nov 2003	4	de Havilland Canada	DHC-8-314	Sydney, Aerodrome, NSW
17 Dec 2003	4	Ide Havilland Canada	DHC-8-202	Sydney, Aerodrome, NSW
27 Jan 2004	4	Ted Smith Aerostar Corp.	601	19km E Byron Bay, NSW
07 Feb 2004	4	Piper Aircraft Corp	PA-28R-200	Eildon, Vic
08 Feb 2004	3	Cessna Aircraft Company	208	Green Island, (VEC), Qld
10 Feb 2004	4	Robinson Helicopter Co	R22 BETA	5km SE Caloundra, (ALA), Qld
19 Feb 2004	3	Aero Commander Div	500-S	58km NNW Hobart, Aerodrome, Tas
28 Feb 2004	4	Boeing Co	767-33A	Perth, Aerodrome, WA
03 Mar 2004	4	Hughes	300	Technical analysis - Hughes 300 accident video for NZ TAIC
08 Mar 2004	4	Burkhart Grob Flugzeugbau	ASTIR CS 77	Tandarra, Vic
09 Mar 2004	4	Boeing Co	737-8BK	4km NE Modbury, Locator, SA
22 Mar 2004	4	Fairchild Industries Inc	SA227-AT	Sydney, Aerodrome, NSW
22 Mar 2004	4	Boeing Co/Boeing Co	767-338ER/767	130km S Oleng, (IFR), Indonesia
27 Mar 2004	4	Centrum Naukowo-Produkcyjne-PZL	M-18	15km SE Bunbury, (ALA), WA

Date of occurrence	Investigation category	Manufacturer	Aircraft model	Location
02 Apr 2004	4	Bell Helicopter Co	47G-3B1	2.5km NW Brisbane, Aerodrome, Qld
06 Apr 2004	4	Airbus	A330-301	Sydney, Aerodrome, NSW
07 Apr 2004	4	Neico Aviation Inc/Boeing Co	Lancair IV-P/737-7BX	93km NW Brisbane, Aerodrome, Qld
11 Apr 2004	4	Beech Aircraft Corp	B200	74km S Mount Magnet, Non Directional Beacon, WA
16 Apr 2004	4	British Aerospace Plc	3201	65km E Mount Gambier, (VOR), SA
19 Apr 2004	4	de Havilland Canada/ Cessna Aircraft Company	DHC-8-102/150G	13km SE Mildura, Aerodrome, Vic
11 May 2004	4	Piper Aircraft Corp	PA-32R-301	Winton, Aerodrome, Qld
27 May 2004	4	Boeing Co	737-700	41km SSE Cairns, Aerodrome, Qld
30 May 2004	4	Robinson Helicopter Co	R22 MARINER	40km S Tobermorey, (ALA), NT
02 June 2004	4	Bell Helicopter Co	212	1km NW Same, Aerodrome, East Timor
03 June 2004	4	Boeing Co/de Havilland Canada	737-376/DHC-8-102	6km W Melbourne, (VOR), Vic
04 June 2004	4	Cessna Aircraft Company	U206A	83km NW Mackay, (VOR), Qld
04 June 2004	4	Cessna Aircraft Company	210N	Utopia Station, (ALA), NT
06 June 2004	4	Cirrus Design Corporation/ Cessna Aircraft Company	SR20/172P	Cowes, (VOR), Vic
14 June 2004	4	Bell Helicopter Co	206B (II)	9km SW Alice Springs, Aerodrome, NT
15 June 2004	4	Hiller Aviation	UH-12E	11km W Innisfail, Qld

Date of occurrence	Investigation category	Manufacturer	Aircraft model	Location
16 June 2004	4	Boeing Co/Boeing Co	747-400/747-400	174km SE Atmap, (IFR), Indian Ocean
18 June 2004	4	Saab Aircraft AB	SF-340A	83km SW Albury, Aerodrome, Vic
19 June 2004	3	Boeing Co/Boeing Co	767-338ER/767-338ER	Samge, (IFR), South China Sea
20 June 2004	4	Cessna Aircraft Company	150F	Gladstone, Aerodrome, Qld
21 June 2004	4	MD Helicopters	MD 520N	30km E Gladstone, Aerodrome, Qld
21 June 2004	4	Boeing Co	717-200	Sydney, Aerodrome, NSW
21 June 2004	4	Airbus	A320-232	Technical Analysis Investigation, Populated place,
22 June 2004	4	Cessna Aircraft Company	404	28km SE Tumut, Aerodrome, NSW

Appendix 6: Aviation recommendations to CASA and Airservices with status *Open* or *No Response*

Recommendation	Description	Issue date	Receiving organisation	Response date	Status of response
R20000130*	The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority identify and adopt an appropriate specification for each grade of fuel that is approved for use in Australia, or in aircraft on the Australian civil register.	30 Mar 2001	Civil Aviation Safety Authority	04 Mar 2002	Open
R20000131*	The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority, either by itself, or in cooperation with other organisations, develop a process to satisfy itself that fuel that is fit for purpose is consistently supplied to aircraft.	30 Mar 2001	Civil Aviation Safety Authority	04 Mar 2002	Open
R20000132*	The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority develop appropriate lines of communication to ensure that it is made aware in a timely manner of information relating to the management of situations related to fuel quality that could affect the safety of flight.	30 Mar 2001	Civil Aviation Safety Authority	04 Mar 2002	Open
R20000133*	The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority ensure that prior to any significant devolution or change in regulatory process, appropriate measures are taken to ensure that aviation safety is not diminished.	30 Mar 2001	Civil Aviation Safety Authority	04 Mar 2002	Open

Recommendation	Description	Issue date	Receiving organisation	Response date	Status of response
R20000186*	The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority review its relationship with other regulatory bodies to clarify the limits of their respective regulatory powers and responsibilities with respect to aviation fuels, to ensure that aviation safety issues are effectively regulated.	30 Mar 2001	Civil Aviation Safety Authority	04 Mar 2002	Open
R20040062	The Australian Transport Safety Bureau recommends that Airservices Australia review the effectiveness of its check and training program in the area of procedural control services.	07 Jun 2004	Airservices Australia	23 Jul 2004	Open

* *CASA's initial response to these recommendations in March 2002 advised that CASA would not be in a position to respond to the content and recommendation of the ATSB Avgas report until such time as a portfolio response to the Senate Rural and Regional Affairs and Transport Report into matters relating to aviation fuel has benn finalised.*

Recommendation	Description	Issue date	Receiving organisation	Response due	Status of response
R20030056	The Australian Transport Safety Bureau recommends that Airservices Australia conduct a review to determine why flight crews were able to submit flight plans and operate on non-standard routes in contravention of the AIP, which required crews to plan on routes provided to the air traffic control system by the publication of air route specifications.	04 Aug 2003	Airservices Australia	03 Oct 2003	No Response
R20030057	The Australian Transport Safety Bureau recommends that Airservices Australia conduct a review to establish the extent of the use of non-standard levels in situations initiated by pilots and in situations initiated by controllers.	04 Aug 2003	Airservices Australia	03 Oct 2003	No Response

Appendix 7: Accident procedures and categorisation

Aviation

Procedures

The *Transport Safety Investigation Act 2003* forms the basis of procedures followed by the Bureau. The ATSB uses the categories below when prioritising its aviation investigations to meet international obligations and achieve the most important safety outcomes within its given budget.

Decision Guidelines for Accident/Incident Categorisation

The ATSB is resourced each year to undertake a finite number of aviation investigations. It is acknowledged, however, that an occurrence with a large number of deaths would represent a 'major accident' and supplementary funding may be required.

In categorising aviation transport safety matters and selecting which of those the ATSB should investigate, the decision-makers must consider:

1. The potential safety value that may be gained by conducting an investigation;
2. On board fatalities and/or serious passenger injuries;
3. The public profile of the occurrence;
4. The extent of resources available and projected to be available; and, in the event of conflicting priorities,
5. Any risks associated with not investigating; and
6. The requirement under s21(2) of the TSI Act for the Executive Director to publish reasons (justification) for discontinuing an investigation where an investigation has already commenced.

The following broad hierarchy should also be taken into account when making the decision to initiate and categorise an investigation:

1. Passenger operations;
2. Freight and other commercial operations; and
3. Non-commercial operations.

The decision to investigate will also have regard as to whether, in the absence of an ATSB investigation, a credible safety investigation is likely.

In view of these considerations, initiation of a formal ATSB investigation can only be made at or above Team Leader level after discussion and agreement with the Deputy Director and/or Director and Executive Director. Each investigation will be categorised on a scale of 1 – 5 (see below).

Following the initial assessment of an occurrence a decision will be made whether or not to conduct a field investigation. Unless otherwise agreed by the Executive Director, all occurrences will initially be categorised at level 4. Subsequently an investigation may be upgraded or downgraded. The decision to upgrade (and commit extra resources) or to downgrade must be made at Deputy Director level or above after discussion with the Director and/or Executive Director. Any decision to discontinue an investigation must be endorsed by the Executive Director.

The following guidance on the categorisation of aviation transport safety matters is intended to serve as a suggested starting point based on initial information. This guidance is not intended to cover all possible scenarios but illustrates a broad range of typical events. It is expected that judgment will be required in order to categorise some events which do not neatly fit these categories or where the circumstances, potential safety value and available resources suggest that they should be assigned a different category.

Aviation Category 1

- An *accident* involving one or more High Capacity Air Transport (scheduled and non-scheduled) passenger aircraft *with fatalities.*
- An *accident* involving one or more High Capacity Air Transport (scheduled and non-scheduled) passenger aircraft *without fatalities*
  - *where there was a significant risk of fatalities or serious injuries and a substantial commitment of investigative resources is likely to significantly mitigate future High Capacity Air Transport accidents and funding is available for an investigation under this category.*
- A *serious incident* (as defined by ICAO see Attachments A & B) involving one or more High Capacity Air Transport (scheduled and non-scheduled) passenger aircraft
  - *where there was a significant risk of fatalities or serious injuries and a substantial commitment of investigative resources is likely*

to significantly mitigate future High Capacity Air Transport (scheduled and non-scheduled) accidents and funding is available for an investigation under this category.

Aviation Category 2

- An *accident* involving one or more High Capacity Air Transport cargo aircraft *with fatalities and serious injuries*.
- An *accident* involving one or more High Capacity Air Transport cargo aircraft *without fatalities* and *serious injuries*
  - *where there was a significant risk of fatalities or serious injuries and a substantial commitment of investigative resources is likely to significantly mitigate future High Capacity Air Transport cargo aircraft accidents and funding is available for an investigation under this category.*
- An *accident* involving one or more Low Capacity Air Transport (scheduled) passenger aircraft *with a significant number of fatalities* (for example, it may involve more than five fatalities) and serious injuries.
- An *accident* involving one or more Low Capacity Air Transport (scheduled) passenger aircraft *without fatalities* or *with a relatively low level of fatalities* (eg less than five) and serious injuries
  - *where there was a significant risk of more fatalities or serious injuries and a substantial commitment of investigative resources is likely to significantly mitigate future Low Capacity Air Transport (scheduled) accidents and funding is available for an investigation under this category.*
- A *serious incident* (as defined by ICAO see Attachments A & B) involving one or more Low Capacity Air Transport (scheduled) passenger aircraft
  - *where there was a significant risk of multiple fatalities (eg more than five) and serious injuries and a substantial commitment of investigative resources is likely to significantly mitigate future Low Capacity Air Transport (scheduled) accidents and funding is available for an investigation under this category.*
- An *accident* involving one or more Low Capacity charter (non-scheduled) aircraft with fare-paying passengers and *multiple fatalities* and serious injuries (for example it may involve more than five fatalities)
  - *where a substantial commitment of investigative resources is likely to significantly mitigate future Low Capacity Air Transport (scheduled) and charter (non-scheduled) accidents and funding is available for an investigation under this category.*

Aviation Category 3

- An *accident* involving one or more Low Capacity Air Transport passenger (scheduled) or charter (non-scheduled) aircraft with fare-paying passengers with *fatalities* and/or serious injuries not classified as a category 2 investigation.
- An *accident* involving Air Transport cargo operations with *fatalities*.
- An *accident* involving one or more training aircraft with *fatalities* and where investigation is likely to significantly mitigate future accidents and funding is available for an investigation under this category.
- An *accident* (as defined by ICAO, see Attachment A) *without fatalities* involving one or more High or Low Capacity Air Transport aircraft not classified as a category 1 or 2 investigation and where investigation is likely to significantly mitigate future accidents and funding is available for an investigation under this category.
- An *accident* involving one or more general aviation aircraft (other than sport aviation) with *fatalities* where investigation is likely to significantly mitigate future accidents and funding is available for an investigation under this category.
- An a*ccident* involving one or more charter or other general aviation aircraft
  - *where there was a significant risk of fatalities or serious injuries and a substantial commitment of investigative resources would significantly mitigate accidents and funding is available for an investigation in this category.*
- A *serious incident* (as defined by ICAO see Attachments A & B) involving one or more High or Low Capacity Air Transport aircraft not classified as a category 1 or 2 investigation and where investigation is likely to significantly mitigate future accidents and funding is available for an investigation under this category.
- A *serious incident* (as defined by ICAO see Attachments A & B) involving one or more Air Transport cargo, charter or training aircraft where investigation is likely to significantly mitigate future accidents and funding is available for an investigation under this category.

Aviation Category 4

- An *accident* involving a foreign aircraft covered by Article 26 of the Chicago Convention that is not being investigated as category 1, 2, or 3.
- An *accident* involving aircraft (other than sport aviation) with fatalities where available resources and future safety considerations do not allow for a more detailed investigation.
- An *accident or serious incident* (as defined by ICAO, see Attachments A & B) involving Australian designed and manufactured aircraft types on the Australian Register with international safety implications not being investigated as category 1, 2, or 3.
- An *accident or serious incident* (as defined by ICAO, see Attachments A & B) involving one or more High or Low Capacity Air Transport aircraft not being investigated as category 1, 2, or 3 and funding is available for an investigation.
- An *accident* (as defined by ICAO, see Attachment A) involving one or more charter or general aviation aircraft without fatalities
  - *where a limited commitment of investigative resources could significantly mitigate future aviation accidents and funding is available for an investigation.*
- A *serious incident* (as defined by ICAO, see Attachments A & B) involving one or more non Air Transport aircraft
  - *where a limited commitment of investigative resources could significantly mitigate future accidents and funding is available for an investigation.*

Aviation Category 5

- An *accident* (including with *fatalities*) or *serious incident* involving a sport aviation aircraft unless foreign and required to be investigated under *Article 26* of the Chicago Convention.
- An *accident* involving aircraft *without fatalities*
  - *where the potential safety lessons do not, after initial review, justify the commitment of investigative resources within available funds. Basic incident data will be filed for statistical purposes.*
- A *serious incident* or *incident* involving aircraft
  - *where the potential safety lessons do not, after initial review, justify the commitment of investigative resources within available funds. Basic incident data will be filed for statistical purposes.*

Attachment A – ICAO definitions for aircraft accidents and serious incidents

Accident. An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:

a) a person is fatally or seriously injured as a result of:

- being in the aircraft, or
- direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
- direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) the aircraft sustains damage or structural failure which:

- adversely affects the structural strength, performance or flight characteristics of the aircraft, and
- would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or puncture holes in the aircraft skin; or

c) the aircraft is missing or is completely inaccessible.

Note 1. For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified as a fatal injury by ICAO.

Note 2. An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.

Serious incident. An incident involving circumstances indicating that an accident nearly occurred.

Note 1. The difference between an accident and a serious incident lies only in the result.

Note 2. ICAO examples of serious incidents can be found in Attachment B.

Attachment B – Aviation accident categories and procedures

List of examples of serious incidents

The incidents listed are typical examples of incidents that are likely to be serious incidents. The list is not exhaustive and only serves as guidance to the definition of serious incident.

- Near collisions requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate.
- Controlled flight into terrain only marginally avoided.
- Aborted take-offs on a closed or engaged runway.
- Take-offs from a closed or engaged runway with marginal separation from obstacle(s).
- Landings or attempted landings on a closed or engaged runway.
- Gross failures to achieve predicted performance during take-off or initial climb.
- Fires and smoke in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents.
- Events requiring the emergency use of oxygen by the flight crew.
- Aircraft structural failures or engine disintegrations not classified as an accident.
- Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft.
- Flight crew incapacitation in flight.

Fuel quantity requiring the declaration of an emergency by the pilot.

Take-off or landing incidents. Incidents such as undershooting, overrunning or running off the side of runways.

System failures, weather phenomena, operations outside the approved flight envelope or other occurrences which could have caused difficulties controlling the aircraft.

Failures of more than one system in a redundancy system mandatory for flight guidance and navigation.

Marine

Decision Guidelines for Accident/Incident Categorisation

The ATSB is resourced each year to undertake a finite number of marine investigations. It is acknowledged, however, that an occurrence with a large number of passenger fatalities or which results in major pollution of the Great Barrier Reef or other sensitive area would represent a 'major accident' that may require supplementary funding.

In categorising marine transport safety matters and selecting which of those the ATSB should investigate, the decision-makers must consider:

1. The potential safety value that may be gained by conducting an investigation;
2. Obligations under international conventions;
3. Recommendations stemming from IMO Assembly resolutions and Committee circulars;
4. The public profile of the occurrence;
5. Whether the occurrence is part of an identifiable trend;
6. The extent of resources available and projected to be available in the event of conflicting priorities and the extent of any investigation backlog;
7. Any risks associated with not investigating; and
8. The requirement under s21(2) of the TSI Act for the Executive Director to publish reasons (justification) for discontinuing an investigation where an investigation has already commenced.

The following broad hierarchy should also be taken into account when making the decision to initiate and categorise an investigation:

1. On-board fatalities and/or serious passenger injuries;
2. The pollution of environmentally sensitive areas;
3. Ships subject to significant structural damage;
4. Occurrences which disrupt, or have the potential to disrupt, major port operations; and
5. Occurrences that do not involve any of the above, but where the requirements of the International Safety Management Code may reasonably be anticipated to have been breached.

The decision to investigate will also have regard as to whether, in the absence of an ATSB investigation, a credible safety investigation by another organisation is likely.

In view of these considerations, initiation of a formal ATSB investigation can only be made at or above Team Leader level after discussion and agreement with the Deputy Director and/or Director and Executive Director. Each investigation will be categorised on a scale of 1 – 5 (see below).

Following the initial assessment of a marine transport safety matter a decision will be made whether or not to conduct a field investigation. Unless otherwise agreed by the Executive Director, all occurrences will initially be categorised at level 4. Subsequently an investigation may be upgraded or downgraded. The decision to upgrade (and commit extra resources) or to downgrade must be made at Deputy Director level or above after discussion with the Director and/or Executive Director. Any decision to discontinue an investigation must be endorsed by the Executive Director.

In assessing initial and developing action on any marine investigation due regard shall be had to the IMO requirements relating to reports on marine casualties and incidents, MSC Circ.953/MEPC Circ 372. This circular outlines the IMO reporting requirements, based on 'very serious', 'serious' and 'less serious' casualties and incidents.

For the purpose of reporting information to the Organisation, ship casualties are classified as 'very serious casualties', 'serious casualties', 'less serious casualties' and 'marine incidents'. Administrations are requested to submit data for all 'very serious casualties' and 'serious casualties'.

Where there are important lessons to be learned from 'serious casualties', 'less serious casualties' and 'marine incidents', full investigation reports should be submitted along with the additional information indicated in annex 3.

Marine Category 1

- An *accident* involving one or more ships resulting in large scale fatalities.

Marine Category 2

- An *accident* involving major pollution of an area of recognised environmental sensitivity such as the Great Barrier Reef.

- The total loss of an Australian ship with loss of life.
- An *accident* involving multiple fatalities.

Marine Category 3

- An *accident* involving one or more vessels involving serious injury.
- An *accident* involving one or more vessels that resulted in pollution of the marine environment or potential pollution of an area of particular environmental sensitivity.
- A failure of a structural member of a ship so as to render the ship unseaworthy.
- The loss, presumed loss, or abandonment of a ship.
- A collision between two ships so that the watertight integrity of one or both vessels is compromised.
- Fire aboard a ship that compromises the seaworthiness of a ship.
- The failure of the main engine, steering gear, or electrical generating system that renders the ship disabled, requiring external assistance to bring the ship to a place of safety.

Marine Category 4

- Collision of a ship with another ship or fishing vessel where the damage to either vessel is significant. An accident involving one or more vessels without fatalities or serious injuries and without substantial property damage where investigation is likely to contribute to mitigating future accidents.
- A ship stranding or grounding.
- Fire aboard ship where the seaworthiness of the ship is not affected
- Contact damage with a navigation aid or port infrastructure.
- Loss of stability such that the ship and its crew are imperilled.
- A ship or other vessel involved in a near collision, near stranding.
- A serious breach of the ISM Code.

When a decision has been made to investigate, marine investigations are initially categorised as Category 4. Following any filed

investigation, the level of investigation will be assessed for the relative benefits to the maritime community and the general public. Any decision to upgrade or downgrade will be made on the recommendation of the Deputy Director in consultation with the Director and/or the Executive Director.

Marine Category 5

- An *accident* or *serious incident* where another competent body will be conducting an investigation and available resources do not warrant an ATSB investigation.
- An *accident* involving one or more vessels without fatalities or significant pollution, where the potential safety lessons do not, after initial review, justify the commitment of investigative resources within available funds. Data will be filed for statistical purposes.
- An *accident* involving contact with navigational or port infrastructure, where the seaworthiness of the ship is not compromised.
- An *accident* or *serious incident* involving a minor breach of the ISM Code.

Rail

Decision Guidelines for Accident/Incident Categorisation

The ATSB is resourced each year to undertake a finite number of rail investigations on the Defined Interstate Rail Network (DIRN). It is acknowledged, however, that an occurrence with a large number of deaths (not including an occurrence that was primarily a road accident) would represent a 'major accident' and supplementary funding may be required.

In categorising rail transport safety matters and selecting which of those the ATSB should investigate, the decision-makers must consider:

1. The potential safety value that may be gained by conducting an investigation;
2. On board fatalities and/or serious passenger injuries;
3. The public profile of the occurrence;

4. The extent of resources available and projected to be available; and, in the event of conflicting priorities,
5. Any risks associated with not investigating; and
6. The requirement under s21(2) of the TSI Act for the Executive Director to publish reasons (justification) for discontinuing an investigation where an investigation has already commenced.

The following broad hierarchy should also be taken into account when making the decision to initiate and categorise an investigation:

1. Passenger operations;
2. Freight and other commercial operations; and
3. Non-commercial operations.

The decision to investigate will also have regard as to whether, in the absence of an ATSB investigation, a credible safety investigation is likely.

In view of these considerations, initiation of a formal ATSB investigation can only be made at or above Team Leader level after discussion and agreement with the Deputy Director and/or Director and Executive Director. Each investigation will be categorised on a scale of 1–5 (see below).

Following the initial assessment of a rail transport safety matter a decision will be made whether or not to conduct a field investigation. Unless otherwise agreed by the Executive Director, all occurrences will initially be categorised at level 4. Subsequently an investigation may be upgraded or downgraded. The decision to upgrade (and commit extra resources) or to downgrade must be made at Deputy Director level or above after discussion with the Director and/or Executive Director. Any decision to discontinue an investigation must be endorsed by the Executive Director.

In relation to any ATSB investigation requested under state or NT legislation the Executive Director's approval to initiate the investigation is required. Where the ATSB reviews an investigation undertaken by another credible body (eg an independent investigation commissioned by a state rail regulator or the ARTC) and wishes to publish the report in the interests of future safety and permission to do so is given, such a report could be published by the Executive Director under the TSI Act with proper attribution.

The following guidance on the categorisation of rail transport safety matters is intended to serve as a suggested starting point based on initial information. This guidance is not intended to cover all possible scenarios but illustrates a broad range of typical events. It is expected that judgment will be required in order to categorise some events which do not neatly fit these categories or where the circumstances, potential safety value and available resources suggest that they should be assigned a different category.

Rail Category 1

- An *accident* involving one or more trains resulting in large scale fatalities and serious injuries, property damage and intense public interest.

Rail Category 2

- An *accident* involving one or more trains with five or more fatalities (except where it is primarily a road accident) plus serious injuries, property damage and intense public interest.

Rail Category 3

- An *accident* involving one or more trains with less than five fatalities (except where it is primarily a road accident), serious injuries and property damage.
- An *accident* involving one or more trains with serious injuries and property damage (except where it is primarily a road accident) where there was a significant risk of fatalities or serious injuries ('on-train' or 'off-train'), substantial property damage and a substantial commitment of investigative resources is likely to significantly mitigate the possibility of future accidents.
- A *serious incident* involving one or more trains and/or failure of a safety management system where there was a significant risk of multiple fatalities and serious injuries and a substantial commitment of investigative resources is likely to significantly mitigate future passenger train accidents.
- An *accident* involving one or more trains at an active level crossing where an investigation is likely to significantly mitigate future accidents.
- Occurrences indicating a trend that may involve serious safety deficiencies.

Rail Category 4

- An *accident* involving one or more trains without fatalities or serious injuries and without substantial property damage where investigation is likely to contribute to mitigating future accidents.
- A *serious incident* involving one or more trains and/or failure of a safety management system where a limited commitment of investigative resources could contribute to mitigating future accidents.
- An *accident* involving one or more trains at a passive level crossing where a limited commitment of investigative resources could mitigate future accidents.
- Any other significant safety occurrence not included in the preceding categories.

Rail Category 5

- An *accident* or *serious incident* where another competent body will be conducting an investigation and available resources do not allow for an ATSB investigation.
- An *accident* involving one or more trains without fatalities where the potential safety lessons do not, after initial review, justify the commitment of investigative resources within available funds. Data will be filed for statistical purposes.
- An *accident* involving one or more trains with 'off-train' fatalities at a passive level crossing which is primarily a road accident.
- An *accident* or *serious incident* involving one or more trains and/or failure of a safety management system where the potential safety lessons do not, after initial review, justify the commitment of investigative resources. Data will be filed for statistical purposes.

Australian Government

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