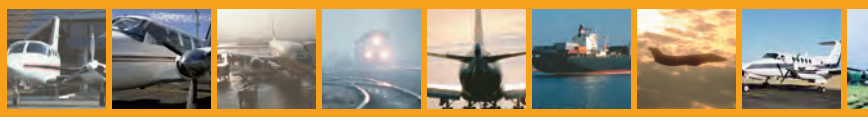
Australian Government
Australian Transport Safety Bureau

The Australian



Executive Director's Message

From January to May of this year, I was seconded from the ATSB after Resources and Energy Minister Martin Ferguson appointed me to work on a joint Western Australian/Commonwealth Government inquiry into offshore petroleum industry regulatory arrangements. The inquiry follows the Varanus Island gas pipeline explosion on 3 June 2008. Two further significant incidents occurred during Cyclone Billy (December 15-24, 2008) and involved maritime petroleum activities on the Karratha Spirit (which resulted in a fatality) and the Castorro Otto.

The ATSB's counterparts in Canada and the United States, the Transportation Safety Board of Canada and the US National Transportation Safety Board, are responsible for investigating and reporting on pipeline incidents. The systems safety knowledge and investigation techniques used in other transport investigations can be transferred very effectively to other high-risk industries such as the oil and gas pipeline industry.

A previous investigation focussed on the technical causes of the Varanus Island incident rather than on broader issues. The current inquiry adopts a systemic approach with a particular emphasis on the regulatory regime and the role and performance of the various regulators.

It has been my pleasure to collaborate with Mr David Agostini, a senior Western Australian offshore oil and gas industry executve. We were supported by an outstanding team that included staff drawn from the ATSB, the Department of Resources, Energy and Tourism, and the Western Australian Department of Mines and Petroleum, as well as several independent experts.

Kym Bills, Executive Director

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Runway Excursions

In the last decade, approach and landing accidents have shown little sign of improving, despite a continuing downward trend in commercial aircraft hull loss rates. Catastrophic landing accidents have occurred recently where aircraft overrun the end of the runway or veer off the side of the runway; collectively, these are called runway excursions. In 2007, notable runway excursions occurred in Thailand, Indonesia and Brazil claiming a total of 309 lives, while in 2008 there were five fatalities associated with an Airbus A320 overrun in Honduras, and four fatalities from a Learjet 60 overrun in South Carolina, United States.

The ATSB chose to study runway overrun accidents because of the serious consequences of this type of event. Part one of a two-part paper provides an overview of Australian and international excursion accidents, involving commercial jet aircraft over the 10-year period between 1998 and 2007, and safety factors that contribute to these accidents. Part two of this report will be released in May 2009, covering risk controls to prevent runway excursions.

Worldwide, 141 runway excursion accidents were identified, resulting in 550 fatalities to passengers, crew and persons on the ground. Most of those accidents (120) occurred during the landing phase. Contributing factors included flight crew techniques or decision, flight crew performance, weather, or systems-related factors.

A detailed analysis of these factors showed flight crew technique and decision-related factors were associated with flying an unstabilised approach, landing too long or fast, incorrect or slow braking, or a decision to land despite unsafe conditions. Flight crew performance-related factors were associated with flight crew awareness of procedures and systems, spatial disorientation, visual illusions, fatigue and task saturation, and assessments of weather and runway condition and their effect on landing length.

Weather-related factors included wet or contaminated runways, excessive tailwinds or crosswinds, insufficient reporting of runway conditions, and reduced braking action. Systems-related factors were most commonly associated with aquaplaning.

In most runway excursions, any one or a combination of these factors can lead to an unsafe outcome. At the time of writing, Australia has been fortunate to not have a serious runway excursion accident such as those seen overseas. However, it is important to recognise that the risk of a runway excursion accident is ever present and that a range of safety measures should be utilised by aircraft operators and airport owners to ensure the risk is minimised. ■

ATSB Research and Analysis Report AR-2008-018(1)

Aviation Safety Investigator

Fuel Mismanagement Issues

Despite advances that have lead to significant improvements in air safety, there are some areas that continue to be of particular concern. One is the issue of fuel mismanagement. Fuel mismanagement can result in either fuel exhaustion (a lack of useable fuel on board the aircraft) or fuel starvation (an interruption of the fuel supply, although adequate fuel is on board). Australian accidents involving fuel exhaustion and fuel starvation have twice been the subject of specific aviation safety research reports: one in 1987 by BASI and the other in 2003 by the ATSB, indicating that that fuel mismanagement continues to be a significant safety issue. In recent weeks, the ATSB has released two investigation reports, detailing accidents that involved different problems with fuel.

On 18 October 2007, the pilot of a Cessna Aircraft Company C404 Titan aircraft, registered VH-TMP, was conducting a charter flight from Beverley airstrip to Adelaide. The pilot had commenced descent when the right engine lost power. There were no apparent anomalies and the fuel quantity gauges were showing adequate fuel in each tank. After securing the right engine, the pilot continued to Adelaide Airport and landed without further incident.

Aircraft maintenance engineers who inspected the aircraft reported that 3 L of fuel was drained from the right tank and 90 L was drained from the left tank. The fuel quantity gauge was indicating 150 lbs (95 L) in the right tank. An engineer found that one of the electrical circuits in the right fuel quantity indication system had a high resistance. After wiring in the circuit was repaired, the fuel quantity gauge correctly indicated zero fuel in the right tank. Calibration of the fuel quantity indication system was carried out and during that process, the left and right signal conditioners were found to be unreliable and were replaced or repaired.

The operator amended its fuel documentation and fuel planning procedures to include a secondary means of verification of fuel on board to cross-check the electric fuel indication system.

On 3 April 2008, a Piper PA-32-300 Cherokee Six aircraft, registered VH-ZMP, lost engine power shortly after takeoff from Brampton Island, Qld under the visual flight rules (VFR) for a charter flight to Mackay, with a pilot and four passengers on board. This was the sixth flight since the aircraft had been refuelled. When climbing through approximately 400 ft, the engine surged and lost power. The pilot ditched the aircraft between Brampton Island and Carlisle Island.

All of the occupants evacuated the aircraft and were later recovered by a rescue helicopter.

Technical inspection of the engine after the accident did not reveal any defect that could have led to the power loss, but the description was consistent with an interruption to the fuel supply to the engine. The aircraft operator's procedures required that reserve fuel be kept in a separate fuel tank from flight fuel. Flight fuel was normally carried in the tip tanks, and reserve fuel was carried in the main tanks. There was sufficient fuel to complete the flight in the main tanks. However, reserve fuel would not have been immediately available because of the delays inherent in resuming fuel flow from another tank once the fuel lines had been purged of fuel. While the pilot did not follow the correct procedures for changing fuel tanks in the event of a reported fuel starvation, it was considered that, even if the correct procedures had been followed, power could not have been replaced in time to prevent the ditching.

Following the event, the aircraft operator amended Cherokee Six fuel procedures to require a minimum of 30 L of fuel in the selected fuel tank for any take-off. ■

ATSB Investigation Report 200706444 and 200802048

Investigation briefs

Controlled flight into terrain

Occurrence 200402797

On 28 July 2004, a Piper PA-31T Cheyenne, VH-TNP, with one pilot and five passengers, on a private instrument flight rules flight from Bankstown to Benalla, collided with terrain 34 km south-east of Benalla. All occupants were fatally injured. Instrument meteorological conditions existed at the time and the pilot had reported commencing a Global Positioning System (GPS) Non-Precision Approach (NPA) to Benalla.

The experienced pilot was familiar with the aircraft and its navigation and autoflight systems. The aircraft diverged left of track, without the pilot being aware of the error. The air traffic control Route Adherence Monitoring (RAM) system triggered alerts, but controllers believed the aircraft was tracking to a different waypoint and did not question the aircraft's position. The destruction of the aircraft navigation and flight control systems did not permit verification of their operational status. The investigation found that instructions to controllers relating to RAM alerts could be ambiguous. The occurrence highlighted the need to pay careful attention to the use of automated flight and navigation systems and the need for effective communication between controllers and pilots to clarify any apparent tracking anomalies.

During the coronial inquest, additional information about the possibility of dead reckoning navigation by the GPS receiver was provided. The ATSB investigation was reopened to examine that possibility and an amended report issued. That investigation found inconsistencies between dead reckoning principles and the recorded radar data. Nor could it reconcile how a pilot would continue navigation by GPS with the alerts and warnings provided by the GPS receiver and the instrument indications. As a result, the ATSB issued a safety advisory notice alerting users of GPS navigation receivers to ensure they were familiar with dead-reckoning operation and any associated receiver-generated warning messages. ■

Loss of control

Occurrence 200606530

On 31 October 2006, a Piper Aircraft Corporation PA-31-350 Chieftain aircraft, registered VH-ZGZ, was being operated on a private category instrument flight rules (IFR) flight from Emerald to Gladstone, Qld. On board were the pilot and two passengers. After departing at 1807 Eastern Standard Time, the flight proceeded normally until the aircraft disappeared from radar while passing about 4,500 ft on descent into Gladstone. It was subsequently determined that the aircraft had crashed 9 km SE of Raglan. The aircraft occupants received fatal injuries.

Conditions in the area of the accident were dark with some rain. Thunderstorms had been forecast but there was no thunderstorm or lightning activity in the area where radar contact was lost.

Recorded radar and voice transmission information indicated that the aircraft was performing normally before it suddenly diverged left from a steady descending flight path and entered a spiral dive.

The aircraft impacted the ground at high speed in a steep, left spiral descent. The aircraft structure was complete at impact. It was established that at impact, both engines were operating at between 2,200 and 2,400 RPM and both propellers were in the normal operating pitch range. There was evidence that the gyroscopic instruments were functioning. The destruction to the wreckage precluded examination of the electrical and fuel systems, the flight controls, and the autopilot.

The pilot's experience on the aircraft type was limited, as was his night and instrument flight experience. The dark and very likely cloudy conditions in the area where the aircraft suddenly diverged from its flight path meant that recovery to normal flight could only have been achieved by sole reference to the aircraft's flight instruments. The difficulty associated with such a task when the aircraft was in a steep descent was likely to have been significant. ■

Breakdown of separation

Occurrence 200702893

On 8 May 2007, at about 1858 Eastern Standard Time, a Boeing Aircraft Company 767-338 (767), registered VH-OGI, was inbound to Sydney, NSW from Melbourne, Vic. on descent to 6,000 ft. At the same time, a SAAB Aircraft Company 340B (SAAB), registered VH-OLL, was departing Sydney for Moruya, NSW on climb to FL140. The distance between the aircraft reduced to 1.5 NM horizontal and 400 ft vertical separation. Separation standards as specified in the Manual of Air Traffic Services (MATS) required the provision of either 3 NM horizontal or 1,000 ft vertical separation between the aircraft. There was a breakdown of separation.

The apparent distraction of the controller by his involvement in a non-operational control room discussion would probably have adversely affected his mental 'air picture' and traffic planning. That included unintentionally clearing the flight crew of the SAAB to climb through the assigned level of the inbound 767, rather than the routinely-assigned intermediate altitude of 5,000 ft. The traffic manager's preoccupation with administrative duties meant that the monitoring and control of the distraction risk and operational activities in the control room was ineffective.

Action by the controllers to issue traffic information to the flight crew of the 767 and a radar vector and altitude limit to the flight crew of the SAAB quickly re-established the required separation standards.

Although no safety issue was identified as a result of this investigation, in its submission in response to the draft report, Airservices Australia advised of its development of an Air Traffic Control (ATC) Reform initiative. The aim of that initiative was to improve the structure and processes used by Airservices to verify ATC operational performance. ■

Collision with terrain

Occurrence 200805302

On 23 August 2008, at about 1030 Central Standard Time, a Robinson Helicopter Company R22 Beta, registered VH-HPY, with a pilot and passenger on board, arrived at the sports ground at Mataranka, NT. The passenger recalled that, on arrival at Mataranka, the pilot carried out a 'bumpy' landing.

The pilot and passenger interacted with people at the sports ground, a number of whom commented that the pilot appeared to them to be affected by alcohol.

Shortly before midday, the pilot and passenger boarded the helicopter to return to the pilot's property. Witnesses nearby reported that soon after takeoff, the helicopter turned towards the approximate direction of the pilot's property. Moments later, the helicopter circled back toward the sports ground at 'tree-top height'.

The helicopter struck powerlines at the entrance to the sports ground before impacting the ground. The passenger stated that the helicopter appeared to be operating normally until that time.

Bystanders were able to remove the seriously-injured passenger from the wreckage; however, the pilot received fatal injuries. The helicopter was seriously damaged.

Examination of the wreckage did not identify any mechanical defects that would have affected the safe operation of the helicopter. The flight at 'tree top height' left little margin for error and toxicological testing of the pilot revealed an alcohol concentration of 0.254%. While the post mortem report indicated that this alcohol level was '...sufficient to have caused some degree of both mental and motor dysfunction' the possibility for post-alcohol impairment to have negatively affected the pilot's performance could not be quantified. ■

Collision with terrain

Occurrence 200801652

On 18 March 2008, at approximately 1115 Eastern Daylight-saving Time, a Pitts S-2A aircraft struck two trees before impacting the ground beside the Northern Road, 7 km north-east of Camden, NSW, fatally injuring the occupant of the rear cockpit.

The occupant of the rear cockpit (the candidate), an experienced aerobatic pilot, was undergoing a routine flight review with an instructor. In the instructor's judgment, the candidate flew well during the flight review until a Practice Forced Landing (PFL) manoeuvre just before the accident.

During the PFL, the candidate stopped responding to instructions and commands, so the instructor took control of the aircraft. A powerful nose-up force began acting on the control column. It required all of the instructor's strength to counteract the force which was causing the control column to move backwards. Despite the instructor's efforts to control the aircraft, it entered an incipient aerodynamic stall. The instructor recovered the aircraft from the stall but, as consequence of the nose-up force, this came too late to prevent a collision with trees.

Immediately after the accident, the instructor pulled himself free of the wreckage. Medical assistance arrived quickly at the scene and it was determined that the candidate was deceased.

No evidence of any mechanical problem with the aircraft was found. Post mortem examination of the candidate found he had severe heart disease.

Expert medical opinion considered it likely that the candidate suffered an incapacitating event as a result of his heart disease. The incapacitating event probably led to him exerting a force on the control column.

The design of the aircraft made it difficult for the instructor to override the control input made by the pilot under review (candidate), delaying the recovery from an incipient stall until it was too late to avoid a collision with trees. ■

Warning placards

On 17 March 2009, Recreational Aviation Australia (RA-Aus) posted on their website Airworthiness Notice (AN) Identification Number – 231208-1 Issue 1, COMPULSORY FITMENT OF BALLISTIC PARACHUTE WARNING PLACARDS (see www.auf.asn.au/airworthiness/AN231208-1.doc)

The notice was related to the need for warning placards to be attached to aircraft fitted with ballistic parachutes. The ATSB has warned of the danger that exists during an accident or incident if rescue personnel are unaware that an aircraft has a ballistic parachute fitted. The inadvertent activation of a ballistic parachute could result in serious injury or fatalities.

AN 231208-1 requires all owners of RA-Aus registered aircraft fitted with ballistic parachutes to:

- If not already fitted, place ballistic parachute warning placards in a position where any person approaching the aircraft from any direction is aware that a ballistic parachute is fitted.
- Place the placard in a position near the parachute pack on the exterior of the aircraft and near the activation mechanism. Placards Must Not be placed on the disposable hatch or egress point of the Ballistic Rocket, instead in close proximity to the egress point and on the main fuselage/visible canister on the aircraft.

RA-Aus have a supply of large (95mm x 95mm) and small (55mm x 55mm), placards available free to owners of the affected RA-Aus aircraft. Contact RA-Aus on 02 6280 4700 or by email tech@raa.asn au ■

REPCON briefs

Australia's voluntary confidential aviation reporting scheme

REPCON is established under the Air Navigation (Confidential Reporting) Regulations 2007 and allows any person who has an aviation safety concern to report it to the ATSB confidentially. Unless permission is provided by the person that personal information is about, the personal information will not be disclosed. Only de-identified information will be used for safety action. To avoid doubt, the following matters are not reportable safety concerns and are not guaranteed confidentiality:

(a) matters showing a serious and imminent threat to a person's health or life;

(b) acts of unlawful interference with an aircraft;

(c) industrial relations matters;

(d) conduct that may constitute a serious crime.

Note 1: REPCON is not an alternative to complying with reporting obligations under the Transport Safety Investigation Regulations 2003 (see www.atsb.gov.au).

Note 2: Submission of a report known by the reporter to be false or misleading is an offence under section 137.1 of the Criminal Code.

If you wish to obtain advice or further information, please call REPCON on 1800 020 505.

Arrival procedures

R200800056

Report narrative:

The reporter expressed concerns that a Boeing 777 taxied directly to the gate at an international airport when the requirement was to shut down and to be towed to the gate. Due to terminal works in progress, the reporter expressed grave safety concerns for the works personnel, equipment and buildings due to jet blast.

REPCON comment:

REPCON provided the Civil Aviation Safety Authority (CASA) with the de-identified report. CASA responded that it was aware of the incident and understood that the airport put in place appropriate safety measures and controls immediately after the occurrence.

Aerodromes in close proximity with the same frequency

R200800075

Report narrative:

The reporter expressed safety concerns that Busselton and Bunbury, WA share the same Common Traffic Advisory Frequency (CTAF). The reporter believed that this results in radio chatter interference which increases the potential for a near miss or a midair collision, particularly when numerous training aircraft, including a number of high-performance turboprop aircraft, are operating at Busselton.

Reporter comment: Either the Busselton or Bunbury CTAF frequency should be changed.

REPCON comment:

REPCON provided CASA with the de-identified report. CASA responded that CASA's General Aviation Operations Group and Office of Airspace Regulation will examine this matter. The issue has also been raised with Airservices Australia who have a briefing session at Bunbury/Busselton planned for May 2009. In the interim, CASA will be encouraging safety education to industry on the importance of abiding by radio procedures.

Unsecured baggage on a commercial flight

R200800079

Report narrative:

The reporter expressed safety concerns about the large amount of unsecured carry-on baggage allowed on board a wide-bodied aircraft, and that this may have impeded an emergency evacuation if it was required. It was reported that the large items of carry-on baggage that could not fit in the overhead lockers were stowed between the passenger's legs and suit packs were carried on passenger laps.

Reporter comment: This is not an isolated event and has been seen to occur regularly on this aircraft type and this sector.

REPCON comment:

REPCON supplied the operator with the de-identified report. The operator advised that it agreed with the general thrust of the report in respect of size and quantity of carry-on baggage on commercial airliners across the industry. The operator indicated that the issue is more pronounced on short-sector flights and, in particular, 'business' flights where passengers want to avoid the baggage belt on arrival. The operator stated that, hypothetically, the safest cabin would be one with no carry-on baggage at all. Anything more than that then becomes a combination of regulatory requirements and commercial considerations.

The operator emphasised that it operates within the regulations and accepts the minimum amount of carry-on baggage that does not put it at a commercial disadvantage in the market place. The operator stated that there are several examples across the industry where an airline has restricted an aspect of their carry-on baggage policy, which has immediately resulted in passengers moving to a less restrictive competitor.

One assertion in the report that the operator did not agree with was the issue with passengers having their suit packs on their laps. The operator reported that the cabin crew are not shy when it comes to writing safety reports on this subject; however, no such report has been submitted to the operator. Importantly, the pre-departure and pre-landing checks specifically focus on such issues.

The operator added that it carries a significant number of people each year and an isolated situation can be imagined where an individual may pick something up from its stowed position under a seat and put it on their lap after the cabin checks have been conducted and the cabin crew have taken their seats. All precautions are taken to avoid this with cabin announcements and observation of the cabin.

REPCON supplied CASA with the de-identified report and a version of the operator's response. CASA advised that the operator's response to the report was reasonable and practical. In accordance with Civil Aviation Order (CAO) 20.16.2 section 3.1, 'Cargo stowed on or above the floor line of compartments occupied by persons and behind any person shall be restrained so as to prevent any article from moving under the maximum accelerations to be expected in flight and in an emergency alighting such as a ditching'.

CASA also responded that this regulation is quite general in its terms. Therefore, it is standard for operators to have documented procedures to ensure compliance with the aircraft manufacturers' design limitations. CASA has undertaken to monitor this issue as part of its ongoing operational surveillance of the operator.

Traffic Information Broadcast by Aircraft (TIBA) procedures

R200800086

Report narrative:

The reporter expressed safety concerns that Traffic Information Broadcast by Aircraft (TIBA) procedures were not adequate to maintain aircraft separation at Moorabbin, Vic. and that full separation by Air Traffic Control (ATC) would be a safer option.

Reporter comment: Air traffic separation services at Moorabbin may have prevented the latest midair collision at Moorabbin.

REPCON comment:

REPCON provided CASA with the de-identified report. CASA advised that Airservices Australia were actively participating in the recently initiated CASA GAAP (General Aviation Aerodrome Procedures) Utility Review, which comprises all the procedures used at all GAAP aerodromes including Moorabbin. The review is expected to enable CASA's Office of Airspace Regulation to determine the most appropriate procedures, and airspace design, to be used for GAAP aerodromes. It is understood that the review includes a safety assessment of the use of TIBA procedures at GAAP aerodromes.

Airservices are currently finalising an internal review of all the GAAP Operational Risk Assessments to ensure that the CASA Review has captured all safety concerns.

REPCON reports received	
Total 2007	117
Total 2008	121
Jan/Feb 2009	24

What happens to my report?	
For Your Information issued	
Total 2007	58
Total 2008	99
Jan/Feb 2009	32
Alert Bulletins issued	
Total 2007	1
Total 2008	12
Jan/Feb 2009	0

Who is reporting to REPCON?#	
Aircraft maintenance personnel	30%
Air Traffic controller	4%
Cabin crew	2%
Facilities maintenance personnel /ground crew	1%
Flight crew	32%
Passengers	5%
Others*	26%

\# 29 Jan 2007 to 28 February 2009
* examples include residents, property owners, general public

How can I report to REPCON?

On line: ATSB website at <www.atsb.gov.au>
Telephone: 1800 020 505
by email: repcon@atsb.gov.au
by facsimile: 02 6274 6461
by mail: Freepost 600,
PO Box 600, Civic Square ACT 2608
For further information on REPCON, please visit our website <www.atsb.gov.au> or call REPCON on: 1800 020 505.