



Australian Government

Australian Transport Safety Bureau

Weight and balance event involving Fairchild SA-227AC, VH-UUO

Melbourne Airport, Victoria, 30 January 2013

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Addendum

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Weight and balance event involving Fairchild SA-227AC, VH-UUO

What happened

On 30 January 2013, at about 0300 Eastern Daylight-saving Time¹ a Fairchild SA-227AC, registered VH-UUO (UUO), departed Melbourne Airport, Victoria for Launceston Airport, Tasmania on a scheduled freight flight. The pilot was the only person on board.

The pilot reported that he conducted the flight planning in an office located away from the aircraft. The pilot prepared a trim sheet to confirm the weight and balance information for the aircraft, then provided an uplift figure to the freight organisation that prepared a loading plan that they used to load the aircraft.

When the pilot approached the aircraft, the freight had been loaded with all cargo access doors closed and the cargo support strut (tail stand) removed. The pilot completed the pre-flight checks in the cockpit and then removed the wheel chocks and wing tip safety markers and placed them in the main cabin area.

During the take-off, the pilot reported that he needed more forward elevator trim than usual to climb out at a 10° nose-up attitude. The pilot noticed that in straight and level flight, the aircraft had full nose-down trim and the aircraft was flying at a 5° nose-up attitude. When the autopilot was engaged, the pilot reported that the autopilot struggled to maintain straight and level flight and the aircraft 'porpoised'.²

The pilot conducted a normal landing at Launceston and checked the freight located in the nose locker. The pilot estimated that the nose locker contained 35 kg of freight when it should have contained about 100 kg. After off-loading the freight at Launceston, the aircraft was reloaded for the next flight, to ensure that the aircraft was within the centre of gravity limits.

Operator investigation

The aircraft operator conducted an investigation into the incident and determined that there was no formalised approach to the loading and unloading of the aircraft, which included:

- freight transferred from other flights not being re-weighed
- the marked weight of freight placed on pallets did not include units of measure or if it was net or gross weight
- the supervisor and ground personnel had not been trained in the loading procedure for the aircraft
- no strict control over the weight being loaded into each zone of the aircraft
- a certain amount of estimating freight weights going into each zone
- no procedures available for where to load cargo when the zone could no longer fit the cargo that was allocated to it.

Fairchild SA-227AC



Source: ATSB

¹ Eastern Daylight-saving Time (EDT) was Coordinated Universal Time (UTC) + 11 hours.

² In flight the aircraft oscillates up and down in the pitch axis.

The loading plan for the aircraft indicated 100 kg of freight in the nose locker of the aircraft. The operator determined that one of the loaders had removed about 70 kg of freight from the nose locker and moved it to the rear of the aircraft.

A test aircraft trim sheet was prepared with the 70 kg of freight removed from the nose locker and added to the rearmost cargo area (zone 5). The centre of gravity remained within limits. The operator determined on the test aircraft trim sheet that moving a further 25 kg of freight from the forward zone to the rear zone would result in the aircraft being at the rear most centre of gravity limit. The freight for the aircraft was not re-weighed at Launceston, so they were not able to determine the exact centre of gravity that existed at the time of take-off from Melbourne. The flight characteristics of the aircraft suggest that the aircraft was either at the most rearward centre of gravity, or just outside the rear centre of gravity limitations.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Operator

As a result of this occurrence, the aircraft operator has advised the ATSB that they are taking the following safety actions:

Aircraft operations safety action

- A Safety Alert was issued to all pilots to advise of several freight loading occurrences reminding pilots that they are to remove the cargo support strut and that they are to ensure that the aircraft is loaded in accordance with the load plan.
- The flight operations department will conduct random ramp checks. The ramp checks will include weighing all freight in given zones of the aircraft as well as complete weighing of all freight in all zones.
- A review of the standard operating procedures for the Metro and ATR fleet.

Ground handling safety action

- Review and publish revisions to the ground handling manual.
- Develop a ground handling training manual.
- Identify and provide training for all employees in ground handling that require training or retraining including agents.
- Establish ramp handling manual that includes all operators.
- Establish risk management plan specific to unloading/loading of aircraft.
- Establish change management plan for revised ground handling arrangements.
- Establish project plan for ground handling.
- Conduct ground support equipment needs/gap analysis at all ports.

Organisational safety action

- Develop a plan to provide training for all employees.
- Establish audit program for oversight.
- Establish standard operating procedures for all facets of operation.
- Identify all managers and supervisors that require training or retraining including agents.

General details

Manufacturer and model:	Fairchild SA-227AC	
Registration:	VH-UUO	
Type of operation:	Freight	
Occurrence category:	Incident	
Primary occurrence type:	Weight and balance event	
Location:	Melbourne Airport, Victoria	
	Latitude: 37° 40.40' S	Longitude: 144° 50.60' E
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The Bureau is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.