

**Aviation Safety Investigation Report
199503986**

**Cessna Aircraft Company
Agwagon**

27 November 1995

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Occurrence Number: 199503986 **Occurrence Type:** Accident
Location: Home Hill, (ALA)
State: QLD **Inv Category:** 3
Date: Monday 27 November 1995
Time: 0650 hours **Time Zone** EST
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	1	0	0	0	1
Ground	0	0	0	0	0
Passenger	0	0	0	0	0
Total	1	0	0	0	1

Aircraft Manufacturer: Cessna Aircraft Company
Aircraft Model: A188B/A1
Aircraft Registration: VH-HYN **Serial Number:** 18803046T
Type of Operation: Commercial Aerial Agriculture - Other
Damage to Aircraft: Substantial
Departure Point: Home Hill Qld
Departure Time:
Destination: Home Hill Qld

Crew Details:

Role	Class of Licence	Hours on	
		Type	Hours Total
Pilot-In-Command	Commercial	3000.0	7300

Approved for Release: Tuesday, February 18, 1997

FACTUAL INFORMATION

Sequence of events

The pilot had been spraying canefields near the accident site. The aircraft was observed flying towards an airstrip about 1 km away where a spray hopper was positioned on a trailer. At about 0650 hours, the aircraft was seen flying straight and level towards the airstrip. The aircraft was then seen to strike powerlines, roll inverted and impact the ground. The aircraft came to rest inverted. The aircraft had impacted two high-voltage powerlines approximately 17 m above ground level.

Damage to aircraft

The fuselage forward of the wing leading edge was destroyed and the engine was forced rearwards into the hopper. The main cockpit structure was intact and the seat and harness were undamaged. The windscreen was broken but the windscreen frame was intact. The instrument panel was badly damaged by impact from the pilot. The fuselage rear of the cockpit area was creased but the tailplane and fin were intact, suffering only minor damage. The right wing outboard leading edge section was severed by powerline contact. The aircraft severed two wires. The top aerial earth wire consisted of three strands of 2.55mm aluminium conductor wound around four strands of 2.5mm steel conductor, and a 66-kilovolt cable consisted of 30 strands of 2.55mm aluminium conductor wound around seven strands of 2.5mm steel conductor.

Meteorological information

The weather was fine at the time of the accident, with a light south-easterly wind.

Wreckage examination

There were no mechanical defects discovered with the airframe or the engine which may have led to the development of the accident. The seat harness was found undone immediately after the accident and did not exhibit any signs of stress as would have been expected after such impact.

Tests and research

Considerable research and testing was carried out to ascertain if there was a possibility of the seat harness being released by impact forces. Testing of the harness and buckle was conducted at Crashlab, the Roads and Traffic Authority of New South Wales test and research centre, which specialises in dynamic testing of safety harness.

Initial examination of the harness found there were no signs of severe loading on the buckle, adjusters, anchors or webbing. However, load bearing marks on the webbing of the lap and shoulder sections of the harness were evident following dynamic testing of the harness.

Dynamic testing of the aircraft safety harness was conducted to test the overall integrity of the harness and also to investigate the possibility of the over-centre buckle being inadvertently released by the occupant's abdominal region during a dynamic impact. The dynamic test demonstrated that the harness was able to restrain the anthropomorphic test dummy without evidence of abnormal distortion, separation or damage to the harness webbing and components. The test also demonstrated that the over-centre buckle did not release during dynamic impact, when correctly latched.

The testing indicated that the aircraft safety harness was not correctly fastened at impact. The possibilities were, therefore, that the harness was not worn at all by the pilot, that the harness was worn but the over-centre buckle was not correctly latched (in other words, the detent mechanism was not fully engaged), or that the buckle was inadvertently unlocked during the flight or accident sequence by clothing or arm contact with the latch.

ANALYSIS

Given that the powerline was the largest and most obvious in the area, it is difficult to understand why the pilot failed to avoid it. The possibility of the low angle of the sun momentarily dazzling the pilot was considered but this is unlikely due to the aircraft being in a right turn and heading in a south-easterly direction shortly before impact. Some witnesses described seeing what appeared to be puffs of smoke from the engine seconds before the aircraft hit the powerline. The aircraft was fitted with a smoke generator so the pilot could assess the wind drift. This could occasionally emit puffs of smoke due to small quantities of oil leaking into the system. The possibility of an engine malfunction distracting the pilot at a crucial moment and diverting his attention to inside the cockpit cannot be discounted; however, there was no evidence found to support this theory.

Examination and testing of the seat harness led to the conclusion that the harness was not fastened at impact. The harness was not fitted with an inertia reel. The possibility that the pilot momentarily undid the harness to retrieve an item from the cockpit floor was considered. However, this is unlikely as the floor cannot be reached even with the harness undone.

SIGNIFICANT FACTORS

1. The aircraft struck a powerline, causing loss of control.
2. The pilot's seat harness was unfastened prior to or during the impact sequence for reasons unknown.

SAFETY ACTION

Action by the Civil Aviation Safety Authority

The Civil Aviation Safety Authority had previously issued Airworthiness Directive (AD) Restraint 7 Amendment 2 for this safety harness buckle [MS22013 (ASG)] in response to industry concerns about inadvertent buckle release during aerobatics.

Action by the Bureau of Air Safety Investigation

As a result of this occurrence, the Bureau of Air Safety Investigation issued Safety Advisory Notice (SAN) 960153 to the Civil Aviation Safety Authority. The safety deficiency identified was:

"AD restraint 7 Amendment 2 for safety harness buckle MS22013 (ASG) refers to utility and acrobatic category aircraft only. The AD should address all categories of operations."