



AIRCRAFT INCIDENT

REPORT

No. 91-010

SAAB SF340A ZK-FXC

Wellington Aerodrome

10 April 1991

Transport Accident Investigation Commission
Wellington, New Zealand

Transport Accident Investigation Commission
Wellington

Chief Commissioner
Transport Accident Investigation Commission

The attached report summarises the circumstances surrounding the incident involving Saab SF340A aircraft ZK-FXC at Wellington Aerodrome on 10 April 1991 and includes suggested findings and safety recommendations.

This report is submitted pursuant to Section 8(2) of the Transport Accident Investigation Commission Act 1990 for the Commission to review the facts and endorse or amend the findings and recommendations as to the contributing factors and causes of the accident.

2 October 1991

R CHIPPINDALE
Acting Chief Executive

APPROVED FOR RELEASE AS A PUBLIC DOCUMENT

7 October 1991

M F DUNPHY
Chief Commissioner

TRANSPORT ACCIDENT INVESTIGATION COMMISSION

AIRCRAFT INCIDENT REPORT NO. 91-010

Aircraft Type, Serial Number and Registration:	SAAB SF340A, 69, ZK-FXC
Number and Type of Engines:	2 General Electric CT7
Year of Manufacture:	1985
Date and Time:	10 April 1991, 1522 hours
Location:	Wellington Aerodrome
Type of Flight:	Air Transport, Scheduled Service
Persons on Board:	Not Applicable
Injuries:	Passengers - 1 Minor
Pilot in Command's Licence:	Not Applicable
Pilot in Command's Age:	Not Applicable
Pilot in Command's Total Flying Experience:	Not Applicable
Information Sources:	Transport Accident Investigation Commission Field Investigation.
Investigator in Charge:	Mr A.J. Buckingham

1. FACTUAL INFORMATION

1.1 During boarding in adverse weather conditions, for a flight from Wellington to Tauranga via Taupo, a passenger walked into a stationary propeller blade, sustaining a scalp laceration.

1.2 The aircraft had landed at Wellington at 1506 hours, after a series of schedule disruptions. The scheduled departure time for the Taupo and Tauranga service was 1525 hours.

1.3 Following passenger disembarkation, the aircraft captain went into the terminal building to obtain updated weather information, the flight attendant assisted an elderly passenger to the traffic counter and the first officer remained on board to carry out checks in preparation for the next sector.

1.4 While the crew was thus occupied, a boarding announcement was made (at 1518) and passengers began making their way unsupervised to the aircraft which was parked at gate 12. Between the terminal building exit and the aircraft, the passengers had to contend head-on with a southerly gale gusting to 47 knots with accompanying rain.

1.5 Entry to the SF340A was via an airstair door on the left-hand side of the aircraft, forward of the wing; passengers had, necessarily, to pass close to the left propeller as they emplaned. The four-bladed propeller was feathered on shutdown and was normally parked in a "3-6-9-12 o'clock" configuration. On this occasion however, the propeller had been partially rotated by the wind. One of the passengers was pushed sideways by a gust as she approached the airstair, and almost lost her footing. As she attempted to regain her balance, she walked into one propeller blade tip and was struck on the forehead above the right eye.

1.6 The passenger boarded the aircraft, only to find that she had been badly cut. The first officer radioed for assistance; at about the same time the cabin attendant returned to the aircraft and was able to assist the victim. Two traffic staff members arrived soon afterward and the passenger was escorted to the dispatch office and met by Air New Zealand's resident nursing sister.

1.7 It was decided, given the apparent severity of the wound, to send the victim by ambulance to hospital. Treatment included 13 stitches and the passenger was able to travel on a flight later that evening.

1.8 During earlier turnarounds, the cabin attendant, aware of the dangers of unrestrained propellers in the prevailing conditions, had insisted that the blades be restrained in the configuration described in 1.5. However the request was not complied with in time on this occasion, although at least one of the following passengers recalled seeing "somebody" taking hold of the propeller, rotating it to the correct position and keeping hold of it while the remainder of the passengers boarded.

1.9 The passengers who were interviewed each stated that in the unpleasant conditions, it was a matter of deciding, at the exit from the terminal building, which was the correct aircraft and "making a dash for it". Only one passenger recalled seeing passenger guidance lines on the tarmac. He considered the purpose of the lines was clear. There was nobody positioned at the terminal exit to provide direction.

1.10 With the aeroplane parked into wind and thus tail-on to the terminal, there was a temptation especially in the conditions at the time of the incident, for passengers to take the shortest line to the foot of the boarding stairs. Although the SF340A was a low-wing aeroplane, there was sufficient clearance under the wing for passengers to pass underneath the wing and thence through the propeller arc enroute to the stairs.

1.11 Discussions with crew members revealed that although each aircraft had been equipped with propeller restraints, these had inadvertently been left in place after "doors close" on some occasions. If this happened they were removed and retained by ground personnel, until the next visit by that aircraft. It was not known what had become of this particular aircraft's propeller restraints at the time of the incident.

1.12 Over the two days following the incident, the airline's ground handling contractors had several sets of propeller restraints manufactured. These comprised heavy duty canvas "blade socks" which were attached by ropes to a heavy sandbag. The socks were fitted to the horizontal blade tips, with the sandbag positioned on the ground beneath the lower vertical blade.

1.13 After the incident the rope and sand bag restraints were used as standard in strong wind conditions, with lighter conditions being catered for by the aircraft's own restraints. The latter consisted of a length of webbing which was placed around the 6 o'clock blade near the root and secured to the engine cowling by locking pins.

1.14 It transpired during the investigation that this incident was one of a number of similar occurrences in the recent past, all, however, involving a lesser degree of injury. The crews involved had brought these to the attention of the company management by means of written reports.

1.15 A previous passenger also volunteered a description of exiting the terminal gate and being confronted with a choice of three similar aircraft with no indication as to which was actually boarding. Only by walking to each aircraft and asking the crews was this determined. The passenger also observed that on this (moderately windy) occasion, none of the aircraft's propellers were restrained and that the blades were "windmilling" in the breeze.

1.16 Although the practice of feathering the propeller on shutting down a free-turbine engine is intended to prevent windmilling, this is completely effective only when the relative airflow is parallel to the aircraft's longitudinal axis. A problem arises when there is any lateral component in the relative airflow; for example, on the "downwind" side of the aeroplane, the lower blades are affected by the relatively unobstructed airflow under the fuselage while the upper blades are partially shielded by the fuselage. This causes rotation of the propeller.

1.17 When these services were run using F27 aircraft, ground staff were normally positioned at the exit gates during boarding to provide passenger guidance. Direction on the actual apron was enhanced by the use of lightweight rope "fences" and walkways were painted on the apron surface. However if a passenger attempted to follow a painted walkway from Gate 12 to a south-facing SF340, it was found that the path led to, and ended within, the arc of the right-hand propeller. These particular walkways became redundant with the removal from service of the F27 aircraft. It was later observed that the walkways serving gates 16A and 16B had been modified to suit the types of aeroplane in current use, i.e. SAAB 340 and Metroliner.

2. FINDINGS

2.1 There was insufficient time between arrival and emplaning to permit the cabin attendant's return to the aircraft ahead of the emplaning passengers.

2.2 Boarding was unsupervised at the time of the incident.

2.3 No guidance was provided for passengers between the terminal exit and the aircraft.

2.4 Adverse weather conditions were a major distraction on the exposed apron area.

2.5 The propeller blade had been rotated from its parked position but was stationary when struck.

2.6 The propeller had not been restrained at the time of the mishap.

3. SAFETY RECOMMENDATIONS

3.1 As a result of this investigation, it was recommended to the Chief Executive of Wellington International Airport Limited:

That the passenger walkway markings at Gates 12 to 14 inclusive be modified to suit the types of aircraft most frequently using these positions (SAAB and Metroliner).

3.2 The following recommendations were made to Air Nelson Limited:

That the company allocate staff to provide positive supervision of embarking and disembarking passengers on open apron areas,

That the company require restraining of at least the left propeller on SAAB 340 aircraft at all times during turnaround, and

That the company consider the use of portable "fences" and guidance signs to enhance passenger control on open apron areas.

7 October 1991

M F DUNPHY
Chief Commissioner