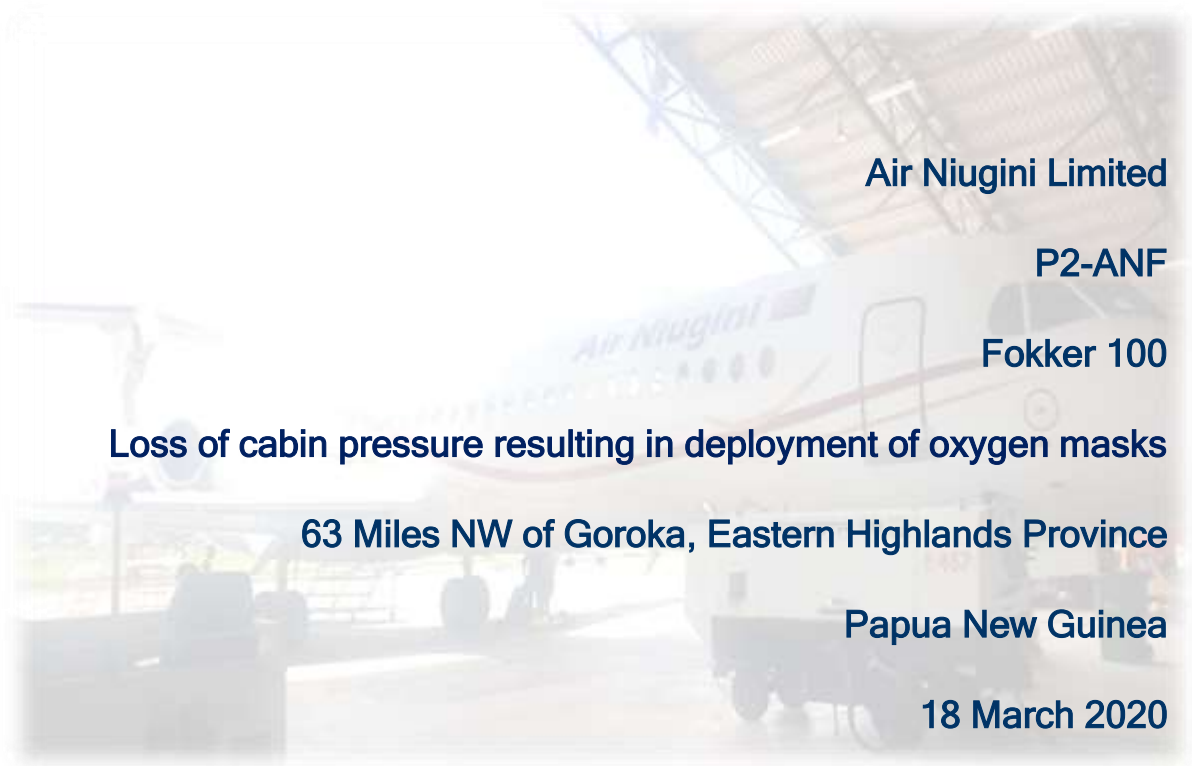
ACCIDENT INVESTIGATION COMMISSION

PRELIMINARY REPORT

AIC 20 - 2002



Air Niugini Limited

P2-ANF

Fokker 100

Loss of cabin pressure resulting in deployment of oxygen masks

63 Miles NW of Goroka, Eastern Highlands Province

Papua New Guinea

18 March 2020

About the AIC

The AIC is an independent statutory agency within Papua New Guinea (PNG). The AIC is governed by a Commission and is entirely separate from the judiciary, transport regulators, policy makers and service providers. The AIC's function is to improve safety and public confidence in the aviation mode of transport through excellence in: independent investigation of aviation accidents and other safety occurrences within the aviation system; safety data recording and analysis; and fostering safety awareness, knowledge and action.

The AIC is responsible for investigating accidents and serious incidents and other transport safety matters involving civil aviation, in PNG, as well as participating in overseas investigations involving PNG registered aircraft.

A primary concern is the safety of commercial air transport, with particular regard to scheduled and non-scheduled operations.

The AIC performs its functions in accordance with the provisions of the *PNG Civil Aviation Act 2000 (as amended)*, and the *Commissions of Inquiry Act 1951*, and *Annex 13* to the *Convention on International Civil Aviation.*

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

The AIC received a notification from PNG Air Services Limited on 19 March 2020 and commenced an investigation on 20 March 2020, dispatching a team of investigators to Air Niugini Limited, Head Office.

This *Preliminary Aircraft Serious Incident Investigation Report* was produced by the AIC, PO Box 1709, Boroko 111, NCD, Papua New Guinea. It is publicly released by the Commission in accordance with *Para 6.5* of *ICAO Annex 13.* The report is published on the AIC website: www.aic.gov.pg.

The report is based on the initial investigation carried out by the AIC in accordance with Papua New Guinea *Civil Aviation Act 2000 (as amended), Chapter 31 of the Commissions of Inquiry Act, Annex 13* to the *Convention on International Civil Aviation,* and the *PNG AIC Policy and Procedures Manual*. It contains factual information. Analysis of these information, findings and contributing (causal) factors, other factors, safety actions, and safety recommendations are reserved for the *Final Report*.

The sole objective of the investigation and the *Preliminary Report* is the AIC's obligation to the *Convention on International Civil Aviation* and in accordance with *ICAO Annex 13*, and thereby promote aviation safety. (Reference: *ICAO Annex 13, Chapter 7*.). Readers are advised that in accordance with Section 219 of the Civil Aviation Act 2000 (as amended) and Annex 13, it is not the purpose of the Commission's aircraft accident investigation to apportion blame or liability. Fact based statements in the report should not be interpreted as apportioning blame.

Consequently, AIC reports are confined to matters of safety significance and may be misleading if used for any other purpose.

Hubert Namani, LLB

Chief Commissioner

15 April 2020

Occurrence details

On 18 March 2020, at 04:15 UTC[1] (14:15 local), a Fokker 100 aircraft, registered P2-ANF, owned and operated by Air Niugini Limited, experienced a cabin depressurisation event during a scheduled IFR[2] passenger flight from Boram Airport, Wewak, East Sepik Province to Jacksons International Airport, Port Moresby. The aircraft subsequently diverted and landed at Madang Airport, Madang Province.

The Pilot in Command (PIC), during interview with investigators, stated that straight after take-off from Boram, the *No.1 engine bleed fault* activated on the overhead panel. They subsequently switched the bleed system off and back on again as required by the *Fokker 100 Quick Reference Handbook (QRH) Bleed Fault* procedure. The fault disappeared and the crew continued with the departure and commenced to climb to Flight Level[3] (FL) 350. The PIC was the designated pilot flying while the co-pilot was the support/monitoring pilot.

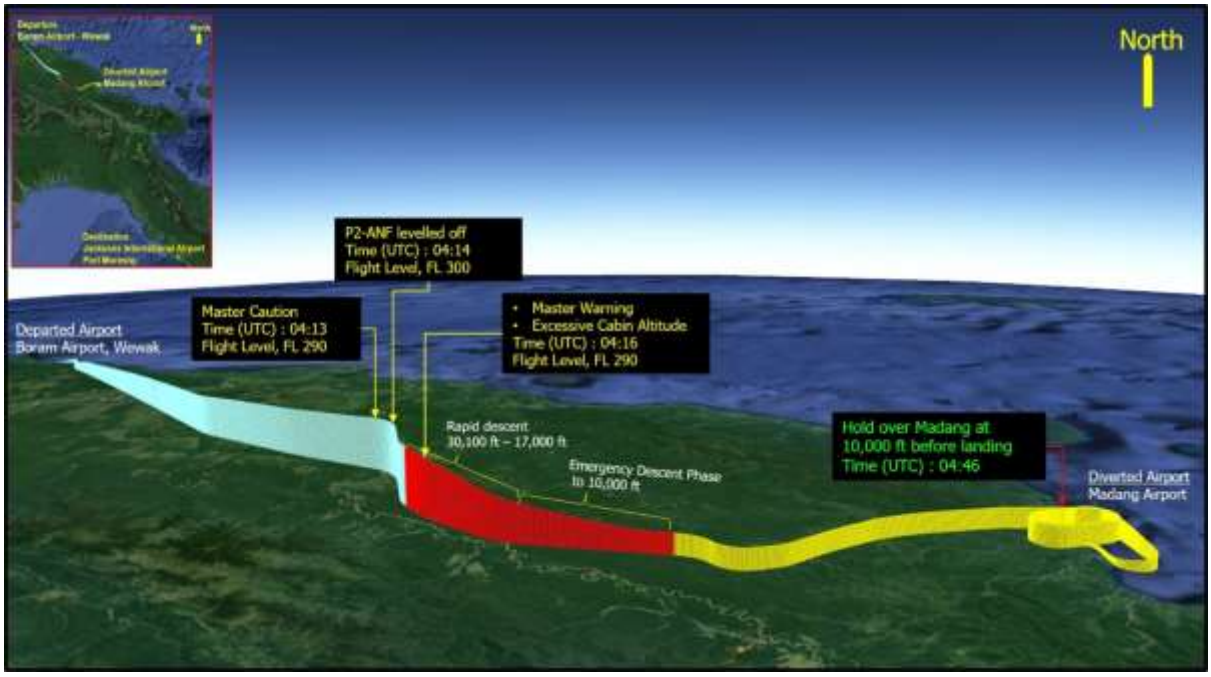


Figure 1: Depiction of flight path from fast rate descend to landing phase.

As the aircraft was climbing, the flight crew reported FL 225 to ATC and requested for a 15 nm deviation from planned track due to weather. ATC authorized the deviation. The PIC subsequently made a 20° left turn and tracked towards the North East, while continue climbing.

1 The 24-hour clock, in Coordinated Universal Time (UTC), is used in this report to describe the local time as specific events occurred. Local time in the area of the serious incident, Papua New Guinea Time (Pacific/Port Moresby Time) is UTC + 10 hours is UTC + 10 hours.

2 IFR, Rules applied in cloud or whenever external cues are below VFR minima which prohibit non-IFR pilots/aircraft. Source: *The Cambridge Aerospace Dictionary*.

3 Level of surface of constant atmospheric pressure related to datum of 1013.25 mb (29.92 in mercury), expressed in hundreds of feet; thus FL 255 indicates 25,500 ft. Source: *The Cambridge Aerospace Dictionary*.

As the aircraft passed FL 290, it entered cloud. The PIC subsequently activated the aircraft's engine anti-icing[4] system. About 3 to 4 seconds later, the *No.1 engine bleed fault* light illuminated on the overhead panel, followed another 3 seconds later by the *No.2 engine bleed fault*. The crew referred to the QRH *'Double Bleed Fault'* checklist and started the actions. Both pilots donned their oxygen masks and switched off both engines bleed systems. The Master Caution[5] (MC) alert activated 5 seconds after the bleed systems were switched off. The PIC levelled the aircraft off just above FL 300 at 04:14. At 04:15 the PIC broadcast a *PAN*[6] and subsequently commenced a rapid descent.

At about 04:16, as the aircraft was descending through FL 290, the Master Warning (MW) activated, along with the '*excessive cabin altitude'*[7] warning. The crew continued with the rapid descent and began actioning the Quick Reference Handbook (QRH) emergency procedures for *'Excessive Cabin Altitude'* and *'Emergency Descent'*.

The aircraft levelled off at 10,000 ft, about 35 nm miles South West of Madang.

The PIC then commenced a right turn and proceeded direct to Madang at 10,000 ft. The aircraft was established in the hold at about 10,000 ft at 04:28, and remained in the hold for about 10 minutes before commencing the approach for runway 25. The aircraft landed at 04:46. The crew taxied the aircraft to the parking bay where a normal passenger disembarkation was carried out,

All 48 occupants of the aircraft; two pilots, three cabin crew and 43 passengers did not sustain injuries from the occurrence.

Altitude and Cabin Pressurisation

According to various studies on human physiology in the air environment, above 10,000 ft of altitude in the Standard Atmosphere, the use of supplementary oxygen is anticipated to avoid adverse physiological effects that could occur as a result of human exposure to the decrease in atmospheric pressure and lower concentrations of oxygen.

Aircraft equipped with pressurisation systems, even when physically operated at altitudes well above 10,000 ft, have the capacity to maintain an internal pressure as though it were flying at 8,000 ft or lower, which allows normal human performance without the need for supplementary oxygen.

In the event of a cabin depressurisation during flight, the occupants of the aircraft are exposed to the existing conditions at the physical altitude in which the aircraft is flying, hence the use of supplementary oxygen becomes necessary to avoid adverse physiological effects.

AIC comment

The investigation is continuing and will include the aircraft, its engines, maintenance and organisational aspects, safety management systems, regulatory, audit and surveillance aspects and other areas as applicable.

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4 The engine anti-icing system uses hot engine bleed-air to give protection from ice on the engine intakes. Two identical systems are installed on Fokker 100, Left for Engine No. 1 and Right for Engine No. 2. *SOURCE: Fokker 100 Aircraft Maintenance Manual.*

5 Annunciation of level 2 alerts which requires immediate pilot awareness and subsequent corrective compensatory action.

6 A radiotelephony urgency signal consisting of the spoken words 'PAN, PAN' mean that an aircraft has a very urgent message to transmit concerning the safety of a ship, aircraft or other vehicle, or of some person on board or within sight. *SOURCE: 'Rules of the Air' Annex 2 to the Convention on International Civil Aviation.*

7 A warning that is presented when cabin altitude exceeds 10 000 ft. *SOURCE: Fokker 100 Aircraft Operating Manual.*

The investigation analysis and findings will be included in the Final report.

Safety Action

At the time of the issue of this Preliminary report, no safety action had been taken.

Recommendations

At the time of the issue of this Preliminary report, no *Safety Recommendation* had been made by the AIC.

General Details

Date and time:	18 March 2020, 04:16 UTC
Occurrence category:	Serious Incident
Primary occurrence type:	System/component failure or malfunction – related to the powerplant (SCF-PP)
Location:	63 miles North West of Goroka Airport, Eastern Highlands Province.

Type of Operation, Injury and damage details

Type of operation:	Scheduled	
Persons on board:	Crew Crew:5 (PIC, FO, CC1, CC2 & CC3)	Passengers: 43
Injuries:	Crew: None	Passengers: None
Damage	Repairable	

Crew details

Pilot In Command (PIC)

Nationality:	Papua New Guinean
Licence type:	ATPL
Licence number:	P20161
Total hours:	11,936.30
Total hours in Command:	9404.00
Total hours on type:	4976.00

First Officer (FO)

Nationality:	Papua New Guinean
Licence type:	CPL (Aeroplane)
Licence number:	P21498
Total hours:	4993.40
Total hours on type:	1876.50

Cabin Crew 1 (CC1)

Nationality:	Papua New Guinean
Total hours:	2,217.80

Cabin Crew 2 (CC2)

Nationality:	Papua New Guinean
Total hours:	3,527.67

Cabin Crew 3 (CC3)

Nationality:	Papua New Guinean
Total hours:	2,049.23

Aircraft Details

Aircraft manufacturer and model:	Fokker F28 Mk0100
Registration:	P2-ANF
Serial number:	11351
Flight Hours	50,951.37
Flight Cycles	52,461.00

Engine Data

Engine type:	Rolls Royce Tay
Manufacturer:	Rolls-Royce
Model:	650-15
Engine number one (Left)	
Serial number:	17235
Total Time since new:	43,212.13
Cycles since new:	38, 860.00
Engine number two (Right)	
Serial Number:	17359
Total Time since new:	50,477.59
Cycles since new:	51,143.00