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Safety recommendation: AIC 24-R09/23-2001

Addressed to: Fokker Services

Date issued: 28 June 2024

Investigation link: AIC 23-2001

Action status: Issued

Introduction

On 20 February 2023, at about 16:00 local time (06:00 UTC), a Fokker 70 aircraft, registered P2-ANTowned and operated by Air Niugini Limited experienced a severe cabin pressurization event during final approach into Jacksons International Airport, Port Moresby, Papua New Guinea, resulting in injuries to some passengers. The AIC immediately commenced an investigation when notified by CASA PNG on 22 February 2023.

Occurrence

On 20 February 2023, at about 16:00 local time (06:00 UTC), a Fokker 70 aircraft, registered P2-ANT, owned and operated by Air Niugini Limited experienced a severe cabin pressurization event during final approach into Jacksons International Airport, Port Moresby, Papua New Guinea, resulting in injuries to some passengers,

There were 71 persons on board the aircraft; two cabin crew, 67 passengers (inclusive of 2 infants).There were injuries reported.; four passengers sustained serious injuries and 16 passengers sustained minor injuries.

Safety Deficiency Description

The pressure control system makes up the cabin pressurisation system. It controls the pressure (altitude) of the cabin and the flight compartment. The pressure in the cabin is regulated by the outflow valves which controls the air from the cabin to go out.
When in Automatic mode, the system maintains a scheduled cabin pressure rate with respect to the following: Pre-selected, Landing Altitude Setting, Aircraft climb and Descent rates throughout the different phases of flight., Variation in Thrust and engine bleed air from the compressors and for descent, dependent on the mode of descent, i.e., Vertical Speed or Altitude Change mode. This is all achieved through the automatic regulating of the Primary Outflow Valves.

When operating in Manual Mode, the crew is required to constantly monitor and adjust the rates of Cabin pressurisation and depressurisation as required to safely achieve either a desired cabin altitude to maintain at a certain cruise altitude, or a desired Landing altitude to descend to for a landing.

The outflow valves work in automatic and in manual mode to control the cabin pressure. In the automatic mode, pressurization begins automatically when the take-off thrust is selected.

After take-off, the Cabin Pressure Controller (CPC) automatically plans a cabin altitude for the aircraft altitude and a rate of cabin altitude change for the aircraft rate of climb and descent. The CPC then commands the outflow valve to regulate the cabin air accordingly.

If the CPC could no longer be able to control the system completely, the manual mode indication is automatically activated and shows on the CPS and prompts for manual mode of operation.
Pushing the push switch PRESS CONTROL activates the MAN(Manual) indication in the push switch to come on and allows the UP/Down (DN) directional control lever and the manual rate-of-change rotary-switch on the CPS to directly control the cabin altitude. Placing the manual control lever to the UP depressurizes the cabin.

The increase and decrease of cabin altitude rate-of-change is achieved by manually turning the rotary-switch towards the Increase (INCR) and towards the Decrease (DECR) position respectively. The cabin altitude increases or decreases until the UP/DN Directional control lever is set back to the centre/middle position.

The investigation found that on initiation of the *Manual Cabin Pressurisation Procedure*, the crew selected the Manual function, moved the Manual control lever to the down position and increased the rate of cabin pressurisation by adjusting the control knob to a rate of 800-1000 fpm. The cabin continued to pressurise manually at the increased rate as the aircraft continued to descend.

Around this time, the passengers started to experience discomfort. This was a result of the increased rate of pressurisation by the crew from 300-400 fpm to 800-1000 fpm. The aircraft continued to descend and at 2,500 ft the crew observed the cabin pressure indicating sea level and subsequently moved the manual control lever from the DOWN position to the MID position. This action only maintained the cabin altitude at sea level, however, as per the procedure, before landing, the manual control lever must be moved to the UP position in order to prevent any further pressurisation and remove all residual pressure from the cabin to avoid a sudden depressurisation on touchdown.

With the manual control lever in the MID position, and the rate control knob maintaining 800-1,000 ft per minute, the application of full thrust during the go-around resulted in a sudden increase in pressurisation from the amount of bleed air produced by the engine compressors. This was when the cabin crew and passengers experienced severe pain and discomfort. The high cabin pressure was also indicated by a high cabin differential reading on the CPC. The cabin differential reached a maximum of 6 psi following the go-around.

In an attempt to reduce the cabin differential, the crew decided to execute the *Abnormal Procedure for Reduced Cabin Differential Procedure*. The *Reduced Cabin Differential Procedure* is used when a lower-than-expected cabin differential is observed as a result of a depressurisation event. On the crew's execution of this procedure, the AIC noted that the final step of the Reduced Cabin Differential Procedure involved placing the manual control lever on the CPC to the UP position. The execution of this step is to remove any residual pressure from the cabin. Given that the cabin had been pressurised as observed on the increased cabin differential, when the crew executed the final step of the procedure, the aircraft experienced a sudden depressurisation via the negative relief valve.

As a result of the sudden depressurisation, a thick cloud of mist was observed in the cabin, similar to that observed on sudden depressurisation at altitude. The aircraft continued with a normal approach and landing.

Recommendation number AIC 24-R09/23-2001 to Fokker Services.

The PNG Accident Investigation Commission recommends that Fokker Services or the Manufacturer review the Abnormal Procedure in the Aircraft Flight Manual (AFM) and relevant Manuals and ensure that the 'Manual Cabin Pressurisation Procedure' is reviewed to clarify the final step of the procedure,

- "BEFORE LANDING:

MANUAL CONTROL LEVER _____UP"

So that the Procedure is completed prior to the crew entering the critical phase of Final Approach to landing, where further manipulation of the CPC may potentially be a distraction.

Action requested.

The AIC requests that Fokker Services note recommendation *AIC 24-R09/23-2001* and provide a response to the AIC within 90 days of the issue date, but no later than 3 October 2024, and explain (including with evidence) how Fokker Services has addressed the safety deficiency identified in the safety recommendation.

Maryanne J Wal
Chief Commissioner

Fokker Services response to Safety Recommendation AIC 23-R09/23-2001

On 19 May 2025, Fokker Services responded to Safety Recommendation AIC 23-R09/23-2001, stating that Fokker Services is still in the process of adjusting the Aircraft Operating Manual (AOM) regarding the adjustment of additional information (i.e. "Remarks") below the abnormal procedures related to Manual Cabin Pressurization.

As stated in their letter TS24.52988, dated 28 August 2024, the current AFM procedures are considered to be correct and technically adequate. Hence, no corrections will be implemented.

Since only the AOM (and QRH) contain additional information on procedures, mentioned as "remarks", the adjustments are proposed for publication in the AOM and QRH only.

The proposed changes are as follows:

Italic = new text ~~Strikethrough~~ = text to be removed Normal = existing text

AOM 4.02.01 page 3

MANUAL CABIN PRESSURIZATION CONTROL PROCEDURE

- CLIMB:
  - MANUAL CONTROL LEVER . . . . . UP
  - MANUAL RATE CONTROL . . . . . AS REQD
  - When reaching target CAB ALT:
    - MANUAL CONTROL LEVER . . . . . MID POS
- DESCENT:
  - MANUAL CONTROL LEVER . . . . . DN
  - MANUAL RATE CONTROL . . . . . AS REQD
  - When cabin altitude reaches landing altitude:
    - MAN CONTROL LEVER . . . . . MID POS
- BEFORE LANDING:
  - MANUAL CONTROL LEVER . . . . . UP

CRUISE ALT (ft)	18 000	20 000	22 000	24 000	26 000
TARGET CAB ALT (ft)	0	1000	2100	3100	4000
CRUISE ALT (ft)	28 000	29 000	31 000	33 000	35 000
TARGET CAB ALT (ft)	5000	5500	6400	7200	8000

Remarks:
- The target cabin altitude is the lowest possible cabin altitude that can be obtained.
- Monitor cabin altitude and cabin vertical speed during climb and descent. *correct if necessary.*
- *Rapid changes in cabin pressure cause discomfort and possibly injury to passengers and crew.*

Figure 1. Fokker Services AOM Amendments

AOM 4.02 01 page 4

REDUCED CABIN PRESSURE DIFFERENTIAL PROCEDURE

DESCEND IF REQD (MAX ALTITUDE 25 000 ft or MEA, whichever is higher)
PRESS CONTROL ..... MAN
- CLIMB:
  - MANUAL CONTROL LEVER ..... UP
  - MANUAL RATE CONTROL ..... AS REQD
  - MONITOR CABIN PRESS DIFFERENTIAL ..... < 5.5 PSI
    - When reaching target CAB ALT:
      - MANUAL CONTROL LEVER ..... MID POS
- DESCENT:
  - MANUAL CONTROL LEVER ..... DN
  - MANUAL RATE CONTROL ..... AS REQD
  - MONITOR CABIN PRESS DIFFERENTIAL ..... < 5.5 PSI
    - When reaching target CAB ALT or landing altitude:
      - MAN CONTROL LEVER ..... MID POS
- BEFORE LANDING:
  - MANUAL CONTROL LEVER ..... UP

CRUISE ALT (ft)	=<12 000	14 000	16 000	18 000	20 000	22 000	24 000	25 000
TARGET CAB ALT (ft)	0	1000	2500	3800	5000	6500	7500	8000

NOTE: If MEA above 25 000 ft, maintain 5.5 PSI CABIN PRESS DIFFERENTIAL.

Remarks:
- Monitor cabin pressure differential and cabin vertical speed during climb and descent, *correct if necessary.*
- *Rapid changes in cabin pressure cause discomfort and possibly injury to passengers and crew.*
- If MEA above 25 000 ft cabin altitude may exceed 10 000 ft.
- When cabin altitude is above 10 000 ft the CABIN ALT warning will be presented.
- In case of a cabin altitude above 10 000 ft consider the use of oxygen masks for crew and passengers. When using crew oxygen for supplemental purposes select the mask regulators to NORM.

Figure 2. Fokker Services AOM Amendments

Fokker Services stated that the date for a general revision of the AOM and QRH is still to be determined.

PNGAIC assessment of Fokker Services response

The AIC has assessed the response provided by Fokker Services and notes that Fokker Services acknowledges the safety deficiency identified and the recommendation. The AIC also notes that Fokker Services proposed corrective actions, would address the safety deficiencies identified in *Safety Recommendation AIC 24-R09/23-2001* when the AOM and QRH amendments are effectuated.

The AIC assigned this response a *satisfactory intent* rating.

The AIC recorded the status of the AIC Recommendation: **MONITOR**

Maryanne J Wal
Chief Commissioner
28 May 2025