ACCIDENT INVESTIGATION COMMISSION

PRELIMINARY REPORT

AIC 20 -1004

MISSION AVIATION FELLOWSHIP

P2-MAF

Cessna 208 Caravan

Runway Overrun at Yenkisa Airstrip

Enga Province

Papua New Guinea

19 March 2020

About the AIC

The Accident Investigation Commission (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 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 transport, with particular regard to fare-paying passenger 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. AIC investigations determine and communicate the safety factors related to the transport safety matter being investigated.

On 19th March 2020 at 03:54UTC (13:54 local time) the AIC received an email and a subsequent phone call, both from representatives of Mission Aviation Fellowship PNG Limited (MAF), to notify an occurrence involving one of their Cessna 208 Caravan aircraft, registered P2-MAF. The AIC immediately commenced an investigation on the occurrence. Just after 05:00 UTC, the AIC sighted images of the aircraft at the accident site posted by locals on Facebook. A team of two investigators was dispatched to the accident site on 20th March 2020 to perform on-site activities, and to interview the pilot involved in the accident and other local witnesses.

This Preliminary Aircraft Accident Investigation Report was produced by the AIC, and contains facts known to the AIC before the official release date. It is developed by the Commission in accordance with Para 7.1 of *ICAO Annex 13*. The report is also published on the AIC website: www.aic.gov.pg.

The report is based on the initial investigation activities 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 Investigation Policy and Procedures Manual*. It contains factual information. Analysis of that information, findings and contributing (causal) factors, other factors, safety actions, and safety recommendations are reserved for the *Final Report*. Some early safety action taken or proposed by MAF has been included in this *Preliminary 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 19 March 2020, at 03:10 UTC[1] (13:10 local time), a Cessna 208 Caravan aircraft, registered P2-MAF, owned and operated by Mission Aviation Fellowship PNG Limited (MAF), conducted a non-scheduled passenger VFR[2] flight from Kompiam to Yenkisa, Enga Province. During its landing roll at Yenkisa strip 32, the aircraft suffered a runway excursion.

There were four persons on board the aircraft; 1 pilot and 3 passengers. No injuries were reported.

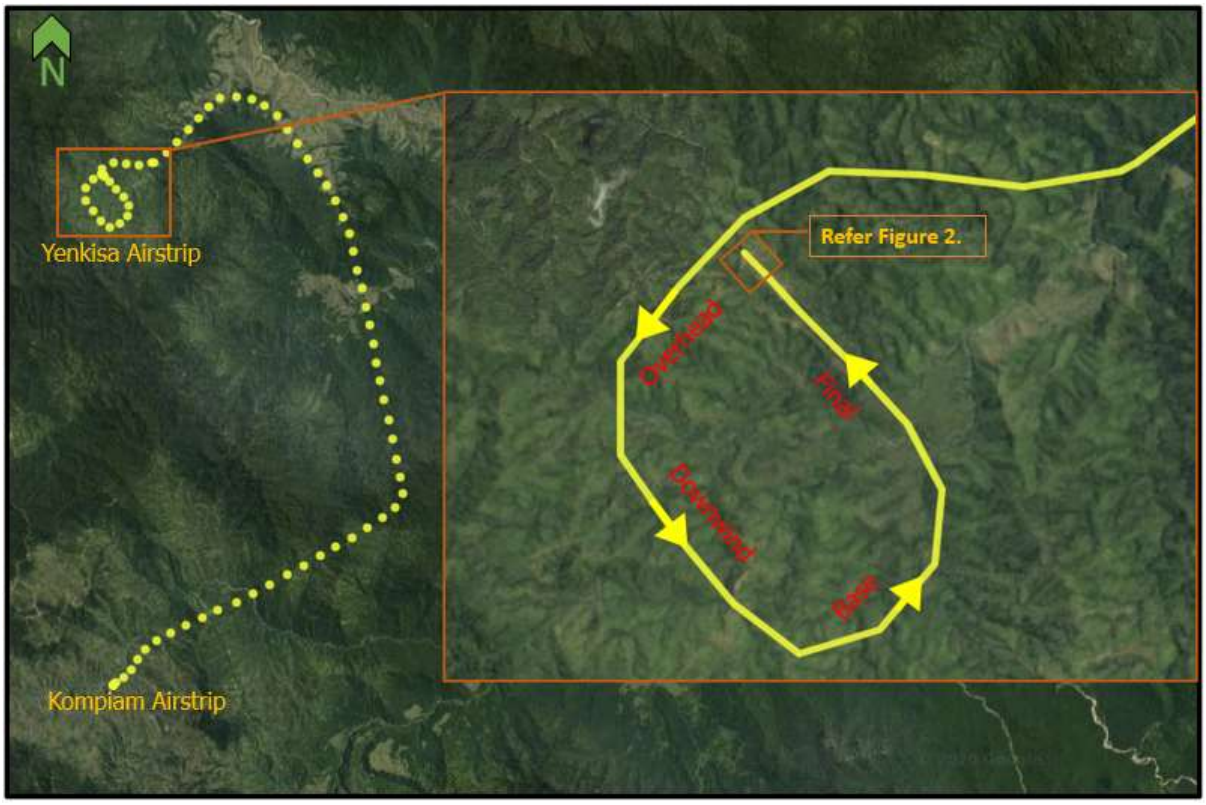

Figure 1: P2-MAF flight path and approach into Yenkisa airstrip.

According to the V2 Tracker[3] recorded data, the aircraft entered the Yenkisa area through the North Eastern valley (see Figure 1). At 03:06 UTC, the aircraft arrived overhead the airstrip at an altitude just above 1,200 ft AGL[4].

During interview, the pilot stated that while overhead the airstrip, he checked the area for wind direction and intensity and strip surface conditions. The windsock located just after the 180m cone marker on the left of the airstrip (see Figure 2) indicated very light north-easterly wind. The trees just before threshold 32 indicated no movement which signified little to no wind at the landing area. There was also no visual sign of standing water on the airstrip.

[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 accident is UTC +10 hours.

[2] Visual Flight Rules - Those rules as prescribed by national authority for visual flight, with corresponding relaxed requirements for flight instruments (*Source: The Cambridge Aerospace Dictionary*). VFR requirements are established in PNG Civil Aviation Rule (CAR) Part 91.

[3] Tracking system that transmits a combination of parameters (such as location, time, altitude, speed, rate of climb, heading and distance) back to the website and mobile application for real-time viewing by end users.

[4] Above Ground level (AGL). All altitude data obtained from V2 Tracker are referenced to the Yenkisa Airstrip threshold elevation of 3,496 ft as per Rural Airstrip Aviation's Airstrip assessment in 2019.

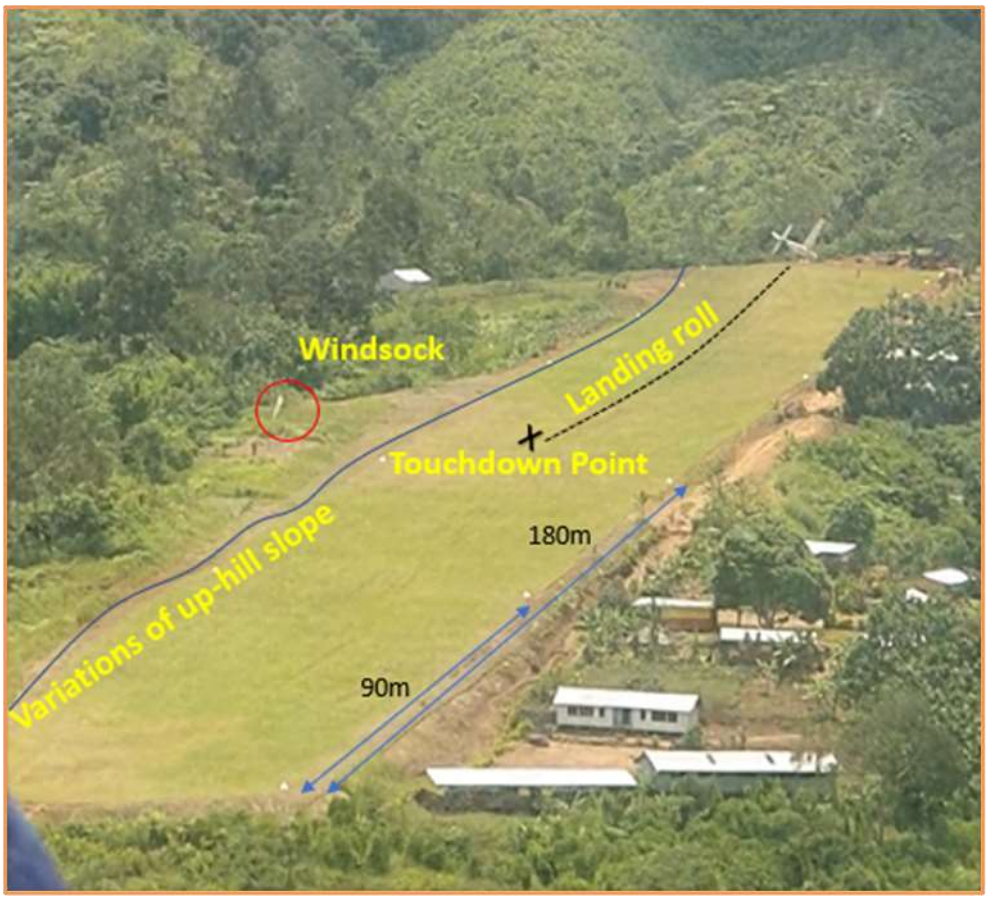

Figure 2: Overrun illustration of P2-MAF at Yenkisa airstrip.

The recorded data showed that the aircraft turned onto the downwind leg just under 1 nm from the airstrip and tracked 1.1 nm towards the South East, parallel to the airstrip (see Figure 1). The pilot then commenced a descending base leg from about 800 ft AGL at an airspeed of 79 kt and subsequently made the final turn, lining the aircraft up on the final approach path at about 400 ft AGL, about 0.5 nm from the threshold, selecting 30° flaps and maintaining an airspeed of approximately 71 kt.

The pilot pointed out that towards the end of the final approach into strip 32, he determined that the glide path was too close to a protruding tree located about 100 m from the threshold. He subsequently pulled back the control column and increased power to shallow the descent angle.

After clearing the tree, the pilot attempted to recover a normal descent. However, at that time the aircraft had already passed the strip 32 threshold, touching down more than 180 m beyond the threshold.

The pilot stated that he immediately selected idle[5], then moved the power lever into the beta[6] range just past the idle gate and applied full braking upon touchdown. However, the aircraft skidded forward on the airstrip as it aquaplaned[7]. Evidence of water on the airstrip surface was captured in an image by a witness (Figure 3).

[5] Set as the slowest practical speed the engine will operate on ground.
[6] Beta Mode is the engine operational mode in which propeller blade pitch is controlled by the power lever. The beta mode may be used during ground operations only. *(Source: Pilot's Operating Handbook and FAA Approved Airplane Flight Manual)*. Beta Range was not to full extent
[7] Wheels lose effective contact with runway covered with standing water resulting in skidding.

Figure 3: Standing water on airstrip coming out from under the tyres of P2-MAF during landing roll. ***(Source: Witness)***

The tyre tracks at the end of the strip (see Figure 7) showed that the right main wheel hit a mound of clay-like soil and rocks as it left the defined strip boundary. This brought the aircraft onto its left side and the left wing subsequently tipped into the gully. The left main wheel fell onto its left side as the right main wheel was raised into the air, and the nose wheel dug into the ground. All propeller blades had evidence of contact with the ground.

At 03:10 UTC, once the aircraft had come to a complete stop, the pilot immediately hit the emergency button on the V2 Tracker. He subsequently shutdown the engines and evacuated the aircraft along with the passengers through the right-side cockpit door.

Figure 4: Back view of aircraft tilting on left side into gully at the end of runway.

Figure 5: Front view of aircraft tilting on left side into gully at the end of runway.

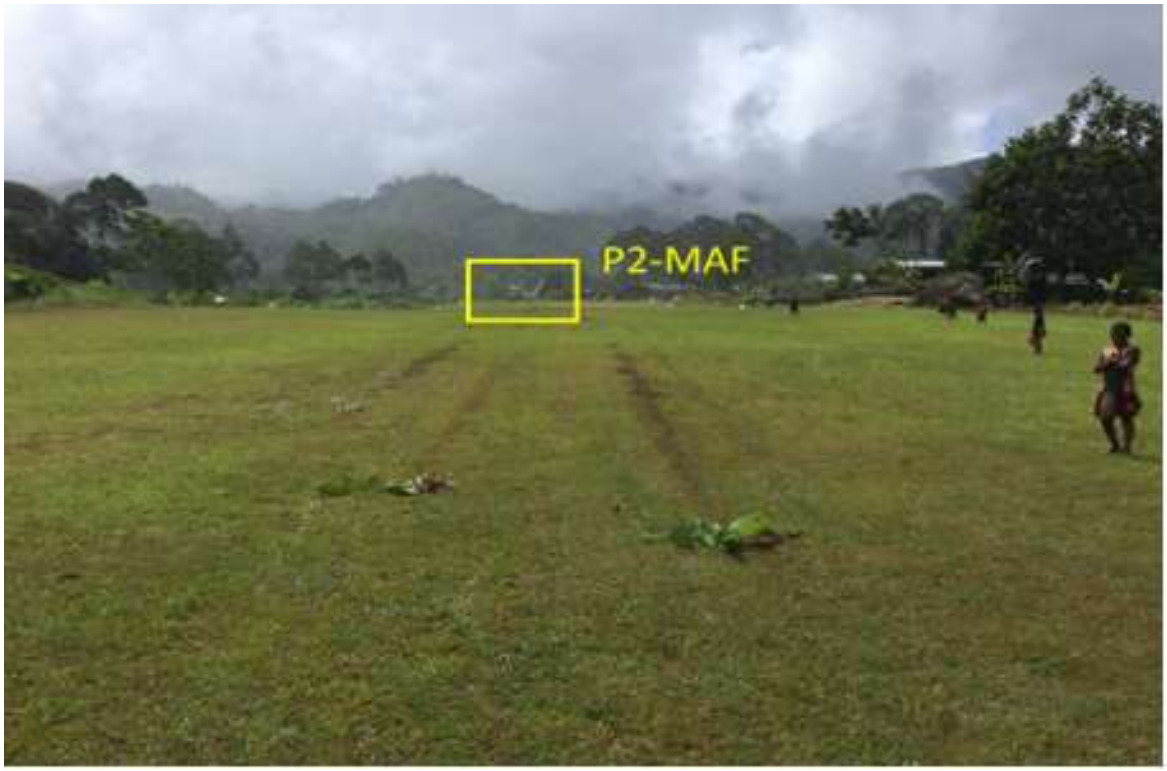

Figure 6: Touch down points of aircraft's wheels on airstrip marked with leaves by locals.

Figure 7: Overrun impression of right main wheel on end of airstrip, and onto mound of a mixture of clay-like soil and rocks beyond the airstrip.

Figure 8: A – Left main wheel laying on its left side supporting the tilted aircraft, B – nose wheel dug into ground, C – Right main wheel in the air upon left side-turn.

Figure 9: All propeller blades showing evidence of contact with ground. A – propeller dug into the ground, B – propeller significantly bent due post impact with ground.

Figure 10: A - Left wing impact point on plant before tilting into gully at the end of runway, B – wing bent upwards about a metre in from the wing tip.

Safety action

Mission Aviation Fellowship PNG Ltd (MAF), safety action

On 7 April 2020 the AIC received a safety action statement from MAF that included safety actions taken by the air operator as a result of an internal analysis of the occurrence. These safety actions are classified as *completed*, *in progress* or *pending*, falling into four specific categories:

1. *Pilots / Qualifications / Checking & Training.*
2. *Airstrip Standards.*
3. *Programme Management / Operational Tempo.*
4. *Corporate Safety Culture.*

A Task Force has been created for "Returning PNG to Flying."

In order to identify the required safety actions to be taken under each category, MAF firstly authorised:

1) *Full stand down of all flight operations, effective 20 March for an indeterminate amount of time.*

The following safety actions have been **completed** by MAF, with MAF providing supporting evidence:

1) *Airstrip Standards have been reviewed through a comprehensive desk-top review of all 213 airstrips to which MAF currently operates. The airstrips were each assessed, given a Risk Rating and assigned respective corrective actions (if deemed appropriate) to be taken.*
2) *Two out of the four safety actions under Corporate Safety Culture have been completed upon the circulation of a memo to all MAF staff:*
    i) *In-country Programme Safety Officer was appointed.*
    ii) *In-country Flight Safety Officer was appointed.*

The significant number of safety actions that have also been listed under the four categories are either still "in progress" or "pending" as follows:

1) *Pilots / Qualifications / Checking & Training:*
    i) *A survey of all pilots to determine their concerns/observations relative to airstrips, their induction to programme, Standard Operating Procedures, etc.* ***In progress.***
    ii) *MAF management assessment team reviewing each pilot's records of training, history in country, and concerns known by management in terms of 10 KSSA[8]s.* ***Pending.***
    iii) *Individual return-to-flying process to be determined for each pilot.* ***Pending.***
2) *Airstrip Standards:*
    i) *17 airstrips require desktop review.* ***In progress.***
    ii) *21 airstrips inspected within past six months are subject to Risk Assessment and Corrective Actions.* ***Pending.***
    iii) *171 onsite inspections required followed by Risk Assessment and Corrective Actions.* ***Pending.***
    iv) *MAF will subsequently have a staged resumption of operations to airstrips that are deemed suitable as per respective risk assessments, or that have had corrective actions*

[8] KSSA: Knowledge, Skills (technical), Skills (non-technical), Attitudes

taken. Flight operations will be resumed to MAF-approved strips prior to all 213 strips being made serviceable. ***In progress.***

3) *Programme Management / Operational Tempo (in progress):*

   i) *In-country Maintenance Controller to be appointed. Person was hired and to have been in-country by March. Waiting for Covid-19 restrictions to be lifted.* ***In progress.***

   ii) *Flight Operations Manager and Crew Training Manager roles to be re-assessed in terms of pilot rostering. Priority to be given to their management roles, not to operational flying.* ***In progress.***

   iii) *Re-evaluation of roles of Operations Director and Flight Operations Manager roles. To ensure appropriate management oversight.* ***In progress.***

   iv) *Operational tempo to be reviewed in light of the fleet transition. Realistic projections to be established.* ***In progress.***

   v) *Significant management focus to be placed on the potential to compromise a safety standard because of a strong service orientation.* ***In progress.***

4) *Corporate Safety Culture:*

   i) *Quality and Safety Officers to have successfully passed CASA Fit and Proper Person / Senior Person (FFP/SP) interviews by end of year.* ***In progress.***

   ii) *Programme Safety Manager and Regional Safety Manager, in conjunction with programme management, to produce a comprehensive baseline risk assessment for Cessna 208 operations in PNG.* ***Pending.***

On 8 April 2020, the AIC received an update from MAF on the progress of safety actions:

> *The safety actions are the general areas / tasks that we have not yet placed into SMART[9] CAPA[10]s. These safety actions will be further refined and some will be split into multiple specific CAPAs. We were awaiting approval from the MAF Board which came Monday (6 April 2020) night. This next week we will develop the SMART CAPAs and then they will be taken from our Taskforce group to our Safety Management System.*

AIC comment

The investigation is continuing and will include operational and organisational aspects, aircraft performance and handling characteristics, environmental influences, safety management, and airstrip data.

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

Recommendations

At the time of the issue of this *Preliminary Report*, no recommendation had been made by the PNG AIC.

[9] Specific, Measurable, Achievable, Realistic and Timely. Actions used to guide goal setting.

[10] Correcting and Preventative Action. consists of improvements to an organization's processes taken to eliminate causes of non-conformities or other undesirable situations.

General Details

Date and time:	19 March 2020, 03:10 UTC (13:10 local time)	
Occurrence category:	Accident	
Primary occurrence type:	Aircraft overran runway (RE: runway excursion)	
Location:	Yenkisa Airstrip, Enga Province	
	Latitude: 5º 06’ 29.10” S	Longitude: 143º 54’ 57.60” E
Elevation (AGL)	3,496 ft	
Strip Orientation	140° take-off direction (14/32; one-way landing strip)	
Length of strip	580 m	
Width of strip	40 m	
Slope	8% up to north west	

Type of Operation, Injury and damage details

Type of Operation	VFR, Passenger flight	
Persons on board	Crew: 1	Passengers: 3
Injuries	Crew: Nil	Passengers: Nil
Damage	Propeller, left wing, nose and left main landing gear, forward left side.	

Pilot Details

Nationality	British
Licence type	CPL
Licence number	P210100
Total hours	1672 hours
Total hours in Command	1300 hours
Total hours on type	668 hours

Aircraft Details

Aircraft manufacturer and model:	Textron Aviation
Aircraft Model	Cessna 208
Aircraft type	Fixed wing single-engine
Number of engines	1
Engine type	Turbo-prop
Registration:	P2-MAF
Serial number:	208-00198

Engine Data

Manufacturer	Pratt & Whitney Canada
Model	PT6A-114A
Serial Number	PCE-PC0841
Total Engine cycles	698
Total Airframe hours	59.4 hours

Propeller Data

Propeller manufacturer and model	McCauley 3GFR34C703-B
Propeller Serial Number	150221
Total propeller hours	2,492.3
Total propeller cycles	563
Hours since overhaul	2,492.3