FINAL REPORT

AIC 14-1003

PAPUA NEW GUINEA

ACCIDENT INVESTIGATION COMMISSION

SHORT SUMMARY REPORT

Niugini Aviation Services

P2-RNB

Pacific Aerospace PAC 750XL

Go-around— collision with terrain

Gulgubip, Western Province

PAPUA NEW GUINEA

19 July 2014

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), Civil Aviation Rules 2004 (as amended), and the Commissions of Inquiry Act 1951 (as amended), and in accordance with 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.

Readers are advised that in accordance with Annex 13 to the Convention on International Civil Aviation, it is not the purpose of an AIC aircraft accident investigation to apportion blame or liability. The sole objective of the investigation and the Final Report is the prevention of accidents and incidents. (Reference: ICAO Annex 13, Chapter 3, paragraph 3.1.)

However, it is recognised that an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the AIC endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why it happened, in a fair and unbiased manner.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation.

The AIC was informed of the PAC-750XL landing accident by the operator, Niugini Aviation Services Limited, on Saturday 19 July 2014. An investigation commenced on Monday 21 July 2014.

The AIC has produced a short summary report for greater industry awareness of potential safety issues and possible safety actions.

Go-around – collision with terrain involving P2-RNB PAC-750

Occurrence details

On 19 July 2014, a Pacific Aerospace PAC 750XL single turbine engine aircraft, registered P2-RNB, owned and operated by Niugini Aviation Services (NAS), was on a charter flight from Kiunga to Gulgubip in Western Province (Figure 1). The aircraft departed Kiunga around 00:01 UTC[1] with the pilot, six passengers, cargo of store goods and passengers' baggage. It was the first time the pilot had ever been to Gulgubip, a one-way airstrip with terrain rising to the north northeast.

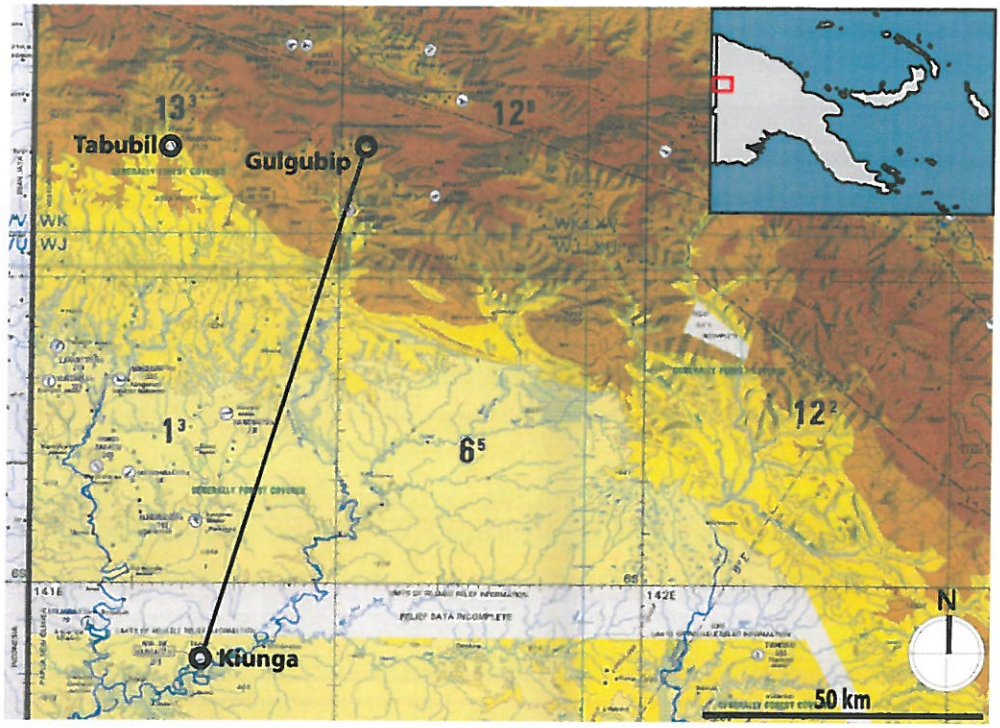

Figure 1: Map of flight area

On arrival over Gulgubip at 1500 ft above ground level, the pilot positioned the aircraft for a left base and on to final for a landing on strip 03. The weather in the area was reported to have been suitable for an approach to land. The pilot then cancelled SARWATCH while in the circuit area at 00:43. He reported that he turned onto final and was unsure of his flight profile during this phase so he initiated a go-around and increased power and raised the nose, but the aircraft did not respond. The aircraft stalled and impacted trees approximately 500 m north northeast of the strip.

The pilot's statements to the AIC and the operator differed from what witnesses reported. The pilot informed the AIC that he commenced the go-around at 500ft above ground level (AGL). The operator informed the AIC that the pilot reported that he commenced the go-around at 300ft AGL, and that witnesses on the ground said 'the aircraft came to a few feet above the runway' when it carried out the go-around. The AIC was unable to determine which of these statements was correct.

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[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, Papua New Guinea Time (Pacific/Port Moresby Time) is UTC + 10 hours.

Figure 2: Final approach view on runway 03 at Gulgubip

Figure 3: The Gulgubip airstrip with an arrow pointing to the windsock from runway 03

Weight and balance

The investigation determined that the aircraft was within the prescribed weight and balance limits.

The pilot

The pilot had 2,930 hours flying experience of which 1900 hours was on the PAC 750, but he had very little experience in Papua New Guinea. He had never been to the Gulgubip airstrip before, but had been checked on similar strips which the check pilot thought would be sufficient training to enable the pilot under training to safely operate into most of the strips the company used.

When asked if he was forced to undertake that [Gulgubip] flight, the pilot replied stating, *"Not directly but been asked before like a charter to Eliptamin and I called the Chief Pilot and told him I've never been to Eliptamin. The response I got was "if you are happy I'm happy".*

The pilot was also queried if he had ever been asked to read company SOPs and answered, *"I've read them, but not asked to; every company documents I read were at my own initiative".*

Further, the pilot stated if he had undergone an induction, *"No, an example is that the last company I worked for I had a week of induction but at NAS* [Niugini Aviation] *it's non-existent. The documents* [SOP/QRH] *are kept in the office and no hard copies in the aircraft. The electronic copies are in the iPad™[2]. Don't have means of charging the iPad™ in the aircraft".*

The investigator asked the pilot if he was able to *"remember how low did he go* [fly] *down over the runway?"*, he stated, *"Wasn't fixated on the height, was more fixated on the obstacles ahead, which I needed to out climb. Later I was told of visual illusions that give the impressions that aircraft will not out climb those obstacles by Hevilift DHC6 fleet manager at Tabubil. I don't understand the visual illusions, but now they make sense to me".*

The operator

The operator, Niugini Aviation, normally conducted non-scheduled passenger and cargo flights from a network of bases around PNG including Gulgubip and some of the other more difficult strips. The company had been in operation for three years prior to the accident. The investigation into the company history showed that there was no evidence that there had been any internal audits carried out in that period of its existence.

The company hired a check and training pilot on a three month contract to train three new pilots brought in from New Zealand and Fiji. He had experience on the PAC 750 aircraft and experience operating into very challenging airstrips. The Instrument of Approval for the Check and Training Captain to conduct training was issued by the Civil Aviation Safety Authority (CASA) of PNG on 7 April 2014.

Due to time constraints, the three new pilots were route and strip endorsed into what the check and training pilot considered the "toughest strips" in the Western Province. They operated into the strips two or three times and when he was satisfied, they were signed out. These strips included Tekin, Bak, and Kuyol. The pilot of RNB stated that he was not satisfied with the length of time [in command under supervision time] given, which was 10 hours per pilot as required by the company insurance. The pilot involved in this accident was the last pilot trained by the training pilot before his contract ended.

The operators *Operations Manual* did not specifically state the requirements for pilots before operating into 'special operations' airstrips such as Gulgubip.

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[2] iPad™ – a touchscreen, liquid-crystal display tablet computer. The user interface is built around the device's multi-touch screen, including a virtual keyboard.

A Safety Audit Report by CASA PNG dated 29/5/14 revealed that the company had an ineffective internal Quality and Safety system, up to the time of release of the report. It stated:

> Anomalies relating to Training administration incl schedule co-ordination with operations; proper application of procedures in Training and Checking manual in conduct of training whilst stated 'corrective action and preventative action' undertaken and in place- were not reflected in the respective document (company exposition) when reviewed.

The pilot did not have a hard copy of the current Operations Manual, and a copy was not kept in the aircraft. An electronic copy was kept on an iPad™ in the aircraft however; the aircraft had no means of charging the iPad™ in the aircraft.

Prior to the accident, the operator had tasked the pilot to land at Eliptamin, an airstrip with similar features to Gulgubip, without having being checked into that airstrip.

Aircraft damage

The aircraft was substantially damaged during the impact with vegetation and terrain. (See Fig. 3).

Figure 3: View of damaged aircraft from the left wing

AIC comment

The AIC was given conflicting statements with respect to when the go-around was commenced. There was no evidence of any defect or malfunction in the aircraft that could have contributed to the accident. It is likely that the go-around was commenced from a low height and the pilot's perception of lack of aircraft performance was affected by the visual illusion as described in the paragraph of this report titled *Visual illusions during approach to sloping airstrips*.

The Pilot flying the aircraft had minimal flying experience in PNG and had never been to Gulgubip. The investigation learnt that he made a call to the company chief pilot to tell him that he had been tasked to operate into Gulgubip, and that he had never been there before. He was to carry trade store goods and six passengers. The pilot recalled in previous situation to operate into Eliptamin, a strip he had never previously operated into, that the chief pilot stated that, 'if you are happy, I'm happy', which could have induced the pilot into making a decision to operate into Gulgubip.

Company pilots were only given 10 hours of in command under supervision training, before they were expected to operate solo into some of the most challenging environments in PNG, and into some of the most difficult airstrips. The AIC considers that the operator did not have a robust check and training system.

The investigation found that at the time of the accident, Niugini Aviation Ltd did not comply with the requirements of *Civil Aviation Rule 135.557(a)(1)(2)(ii)&(vii) Initial training for crew members, and 135.563(b)&(2) Flight crew training program.*

Visual illusions during approach to sloping airstrips

> **Illusions during the approach and landing, an excerpt**
> (from Dr Dougal Watson)
>
> Virtually every pilot has experienced some form of illusion during the approach and landing phases of a flight. Few cause more than an untidy approach or a hard landing, unfortunately fewer still are recognized for what they are - ILLUSIONS. The approach and landing is the most demanding phase of a flight due to the precision required and the increased workload. The last thing that a pilot needs is some form of disorienting illusion to interfere with these final flight segments. There are a variety of illusions that can create problems during the approach and landing. Fortunately it is usually possible, through understanding and preparation, to prevent these illusions from causing problems.
>
> While flying an approach we continuously monitor our progress on the glideslope, the flare, and the landing. Unconsciously we compare each approach to a 'model' built up in our mind from all previous approaches and landings. This 'model' lets us know where things should be, how they should look, and how they should move relative to one another at different times during the approach and landing. Our sense of vision is of prime importance in aviation (See 'Visual dominance can lead to illusions and disorientation', Aviation Bulletin, March 1992) and it is usually visual cues that allow us to recognize whether our approach is above, below, or on the planned glideslope. These visual cues include the apparent shape and size of the runway, the spacing and size of runway markings, the relative size of nearby objects such as windsock, cars, and buildings, and the way objects move in relation to one another and the aircraft. It is these cues and others, that we continuously compare with our mind's 'model' to determine whether the approach is progressing as expected. When the visual cues do not fit our expectations ('model') we usually recognize the approach as not being 'right' and make adjustments accordingly. This may include corrective alteration of the power settings, the aircraft attitude or heading, flap or gear extension, or in the extreme a missed approach.

Sloped strips are known for causing perception problems on final approach. A down-sloping strip can induce a pilot into imagining the aircraft is low when it is not, whereas an up-sloping strip can induce a pilot into imagining the aircraft is high. For that reason, there is a tendency to land long on a down-sloping strip — exactly what should be avoided. The reverse is true on an up-sloping strip. If a pilot on approach to an up-hill strip succumbs to the illusion, the aircraft may get so low that the pilot has to apply full power at a late stage of the approach to avoid undershooting.

Recommendation AIC 15-R14/14-1003 to Niugini Aviation Services

The Accident Investigation Commission recommends that Niugini Aviation Services review its training and checking procedures to ensure on-going compliance with the requirements of *Civil Aviation Rule 135.557(a)(1)(2)(ii)&(vii) Initial training for crew members, and 135.563(b)&(2) Flight crew training program.* Attention should be given to ensure that operations into airstrips classed as 'special operations' strips is captured in its company operations manual.

Niugini Aviation Services response

Signed response dated 27 August 2015.

> Safety Deficiency stated above has been identified by CASA PNG and the Director has advised Niugini Aviation Services (NAS) management to address it accordingly.
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> Attached as per **Appendix C** is the letter of "Notice of Proposed Adverse Action (NPAA)" from CASA PNG Director to NAS CEO which conversely covered the area AIC highlighted.
>
> In light of that NAS has responded in addressing each safety item to the Director. Attached as per **Appendix D** is NAS response to CASA PNG Director.
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> As a result of NAS response to CASA PNG Director's NPAA, the Director has satisfied with NAS response with conditions that NAS has met. Attached as per **Appendix E** is the CASA PNG Director's response.

PNG Accident Investigation Commission (AIC) assessment of Niugini Aviation Services (NAS) response

Having reviewed the NAS documents and noting the CASA PNG findings and response to action taken by NAS relating to the safety issues, the AIC has assessed the NAS response as **satisfactory.** The AIC notes that the NAS will be subject to further CASA PNG review in November 2015 for the reissue of its Air Operator's Certificate (AOC). The AIC therefore considers that the action taken should reduce or eliminate the safety deficiency identified in the recommendation AIC 15-R10/15-2019. The AIC has assigned the following status.

Status of the AIC Recommendation AIC 15-R10/15-2019: CLOSED

General details

Date and time:	19 July 2014 01:43 UTC	
Occurrence category:	Accident	
Primary occurrence type:	Go around – collision with the ground	
Damage	Destroyed	
Location:	Gulgubip, Western Province, Papua New Guinea	
	Latitude: 05°16.73′S	Longitude: 141° 32.51′E
Type of operation:	Charter	
Persons on board:	Crew: 1	Passengers: 6
Injuries:	Crew: 1	Passengers: 0

Aerodrome details

Aerodrome and code	Gulgubip	
Runway directions and slope	03/21	Slope 6% UP to NNE
Runway surface and strength	White gravel	
Runway	Length 450 m	Elevation 4,650 ft

Pilot details

Nationality	New Zealand
Licence type	PNG Certificate of Validation
Licence number	NA
Total hours	2930.0 hours
Total hours on type	1900.0 hours
Total hours last 90 days	93.6 hours
Total hours last 7 days	22.5 hours

Aircraft Details

Aircraft manufacturer and model:	Pacific Aerospace Ltd PAC 750XL
Registration:	P2-RNB
Serial number	XL190
Total time in service	361.0 hours
Engine	
Engine manufacturer and model	Pratt and Whitney Canada PT6A-34
Engine serial number	PCE-RB0711
Total time new	361.0
Propeller	
Propeller manufacturer and model	Hartzell Propeller Incorporated
Propeller serial number	BUA 32685

Approved

David Inau, ML, Chief Executive Officer. 11 October 2015