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NATIONAL TRANSPORTATION SAFETY COMMITTEE

Aircraft Accident Investigation Report

MIMIKA AIR

Pilatus Porter PC-6 ; PK-LTJ

Mt. Gergaji, Papua

Republic of Indonesia

17 April 2009

NATIONAL TRANSPORTATION SAFETY COMMITTEE
MINISTRY OF TRANSPORTATION
REPUBLIC OF INDONESIA
2009

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GLOSSARY OF ABBREVIATIONS

AD	:	Airworthiness Directive
AFM	:	Airplane Flight Manual
AGL	:	Above Ground Level
ALAR	:	Approach-and-Landing Accident Reduction
AMSL	:	Above Mean Sea Level
AOC	:	Air Operator Certificate
ATC	:	Air Traffic Control
ATPL	:	Air Transport Pilot License
ATS	:	Air Traffic Service
ATSB	:	Australian Transport Safety Bureau
Avsec	:	Aviation Security
BMG	:	Badan Meterologi dan Geofisika
BOM	:	Basic Operation Manual
°C	:	Degrees Celsius
CAMP	:	Continuous Airworthiness Maintenance Program
CASO	:	Civil Aviation Safety Officer
CASR	:	Civil Aviation Safety Regulation
CPL	:	Commercial Pilot License
COM	:	Company Operation Manual
CRM	:	Cockpit Recourses Management
CSN	:	Cycles Since New
CVR	:	Cockpit Voice Recorder
DFDAU	:	Digital Flight Data Acquisition Unit
DGCA	:	Directorate General Civil Aviation
DME	:	Distance Measuring Equipment
EEPROM	:	Electrically Erasable Programmable Read Only Memory
EFIS	:	Electronic Flight Instrument System
EGT	:	Exhaust Gas Temperature
EIS	:	Engine Indicating System
FL	:	Flight Level
F/O	:	First officer or Copilot
FDR	:	Flight Data Recorder
FOQA	:	Flight Operation Quality Assurance
GPWS	:	Ground Proximity Warning System
hPa	:	Hectopascals

Hrs	:	Hours
ICAO	:	International Civil Aviation Organization
IFR	:	Instrument Flight Rules
IIC	:	Investigator in Charge
ILS	:	Instrument Landing System
Kg	:	Kilogram(s)
Km	:	Kilometer(s)
Kt	:	Knots (nm/hours)
Mm	:	Millimeter(s)
MTOW	:	Maximum Take-off Weight
NM	:	Nautical mile(s)
NTSB	:	National Transportation Safety Board (USA)
KNKT/NTSC	:	Komite Nasional Keselamatan Transportasi / National Transportation Safety Committee
PIC	:	Pilot in Command
QFE	:	Height above airport elevation (or runway threshold elevation) based on local station pressure
QNH	:	Altitude above mean sea level based on local station pressure
RESA	:	Runway End Safety Area
RPM	:	Revolution Per Minute
ROV	:	Remotely Operated Vehicle
SCT	:	Scattered
S/N	:	Serial Number
SSCVR	:	Solid State Cockpit Voice Recorder
SSFDR	:	Solid State Flight Data Recorder
TS/RA	:	Thunderstorm and rain
TAF	:	Terminal Aerodrome Forecast
TPL	:	Towed Pinger Locator
TSN	:	Time Since New
TT/TD	:	Ambient Temperature/Dew Point
TTIS	:	Total Time in Service
UTC	:	Universal Time Coordinate
VFR	:	Visual Flight Rules
VMC	:	Visual Meteorological Conditions

INTRODUCTION

SYNOPSIS

On the morning of 17 April 2009, a Pilatus PC-6/B2-H4 Turbo Porter aircraft, registered PK-LTJ, operated by PT. Mimika Air, charter flight from Ilaga to Mulia in the Puncak Jaya District of Papua. The Mimika Local Government owned the aircraft. There were 11 people on board; one pilot, one observer, and nine passengers comprised of eight adults and one infant. The aircraft was also carrying National Government election boxes.

The flight in accordance with the visual flight rules was estimated to take 18 minutes. There was no record of communication with the aircraft during the flight. Two minutes after the estimated time of arrival, when the Porter had not arrived, a search was commenced. On 18 April, search aircraft located the wreckage of the Porter at an elevation of about 12,000 feet on Mt Gergaji. The location was on the direct track between Ilaga and Mulia. The aircraft impacted the ground in an inverted attitude, and was destroyed by the impact forces and the post-impact fire. All occupants were fatally injured.

The weather in the valleys along the route was mostly clear, with cloud on the mountains. The route flown by the pilot was the direct track, which passed over a mountain range, with a high peak adjacent to, and west of the track at about the midway point, at 13,700 feet.

The investigation determined that it was likely that the pilot had flown the aircraft into cloud and lost control of the aircraft in instrument meteorological conditions. The impact signature was consistent with uncontrolled flight at the time of impact. This probably resulted from the pilot becoming spatially disoriented after entering cloud.

The National Transportation Safety Committee made recommendations to the Directorate General of Civil Aviation relating to pilot licensing and route familiarization for pilots operating in remote and mountainous regions such as Papua. Particular attention should be given to visual flight operations in mountainous and unpredictable weather conditions.

1 FACTUAL INFORMATION

1.1 HISTORY OF THE FLIGHT

On 17 April 2009, a Pilatus PC-6/B2-H4 Turbo Porter aircraft, registered PK-LTJ, operated by PT. Mimika Air, was on a visual[1] charter flight from Ilaga to Mulia in the Puncak Jaya District of Papua. The Mimika Local Government owned the aircraft. There were 11 people on board; one pilot, one safety officer, and nine passengers comprised of eight adults and one infant. The aircraft was also carrying National Government election boxes.

Witnesses reported that the aircraft departed from Ilaga at about 1000 local time (0100 Coordinated Universal Time (UTC))[2]. The estimated flight time was 18 minutes. At 0123, when the Porter had not arrived, aircraft operating in the area attempted to establish radio communications with the Porter. The search was scaled up after Timika Air Traffic Control (ATC) received a number of reports from search aircraft and over-flying aircraft, of a signal from an Electronic Locator Transmitter.

On 18 April 2009, search aircraft located the wreckage of the Porter at an elevation of about 12,000 feet on Mt Gergaji; 03°52’050”S, 137°45’48”E. The location was on the direct track between Ilaga and Mulia. All occupants were fatally injured.

Figure 1: Aerial view of the wreckage of PK-LTJ on the slope of Mt Gergaji

1 In accordance with the visual flight rules; clear of cloud.

2 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, East Indonesia Standard Time (Waktu Indonesia Timur (WIT)) is UTC +9 hours.

1.2 INJURIES TO PERSONS

Table 1: Injuries to persons

Injuries	Flight crew	Passengers	Total in Aircraft	Others
Fatal	2	9	11	-
Serious	-	-	-	-
Minor	-	-	-	-
Nil Injuries	-	-	-	-
TOTAL	2	9	11	-

The pilot was a Myanmar citizen. All of the other aircraft occupants were Indonesian citizens.

1.3 DAMAGE TO AIRCRAFT

The aircraft was destroyed by the impact forces, and the post-impact fire.

1.4 OTHER DAMAGE

There was no damage to other property or the environment.

1.5 PERSONNEL INFORMATION

The operator was asked to provide details of the pilot's recent flight hours beside his total flight hours; but at the time of finalizing this report the recent flight hours had not been supplied to the investigation.

1.5.1 Pilot in command

Date of birth	:	7 June 1971
Gender	:	Male
Nationality	:	Myanmar
Myanmar Licence	:	Commercial (CPL)
Date of Issue	:	15 May 2008
Valid To	:	19 April 2009
Type Rating	:	PC-6
Date of Medical	:	15 September 2008
Valid To	:	15 March 2009
Medical Certificate	:	First Class
Indonesian Validation	:	Commercial (CPL)
Date of Issue	:	12 February 2009
Valid To	:	11 June 2009
Indonesian Medical	:	11 December 2008
Valid To	:	11 June 2009
Aircraft Type Rating	:	Pilatus PC-6
Total Hours	:	2664 hours 50 minutes
This Make and Model	:	1412 hours 40 minutes
Last 90 days	:	Not provided
Last 7 days	:	Not provided
Last 24 Hours	:	Not provided

The pilot held a current Commercial Pilot Licence (CPL), issued in the State of Myanmar, which was valid to 19 April 2009. He also held a Validation Certificate issued by the Indonesian Directorate General of Civil Aviation on 12 February 2009, which was valid to 11 June 2009.

The pilot commenced commercial flying operations with Mimika Air after he received the license Validation Certificate on 12 February 2009.

1.6 AIRCRAFT INFORMATION

1.6.1 General

Aircraft Manufacturer	:	Pilatus Aircraft Ltd
Aircraft Model/Type	:	PC-6/B2-H4
Serial Number	:	959
Year of manufacture	:	2008
Aircraft registration	:	PK-LTJ
Certificate of Registration validation	:	17 September 2009
Certificate of Airworthiness validation	:	17 September 2009
Total hours since new	:	542 hours 12 minutes at 16 April 2009

1.6.2 Engine

Engine type	:	Turboprop
Manufacturer	:	Pratt & Whitney Canada
Model	:	PT6-A-27
Serial number	:	PCE-PG 0360
Total Hours Since New	:	542 hours 12 minutes at 16 April 2009

1.6.3 Propeller

Propeller Type	:	Variable Pitch Propeller
Manufacturer	:	Hartzell
Model	:	HC-D4N-3P/D9511F
Serial Number	:	FY3104
Total Hours Since New	:	542 hours 12 minutes at 16 April 2009

1.6.4 Aircraft maintenance

The aircraft had no recorded defects before the accident. Maintenance records indicated that the aircraft was equipped and maintained in accordance with Indonesian regulations and approved procedures.

1.6.5 Weight and balance

The passengers manifest number PM: 010068, dated 17 April 2009, was signed by three persons; an officer of the Mimika Air Sales Department, the Ground Handling Agent, and the Station Manager. The manifest was for the flight sector from Ilaga to Mulia and listed nine passengers, at a total weight of 640 kg. No passenger baggage weights were listed. Although the aircraft was carrying National Government election boxes filled with voting papers, they were not listed on the manifest. The weight and balance sheet indicated a payload of 675 kg. The weight and balance sheet also indicated that the aircraft was loaded within weight and balance limitations. Due to the destruction of the aircraft, the investigation could not conclusively determine the weight and balance of the aircraft at the time of the accident.

1.7 METEOROLOGICAL INFORMATION

The weather in the valleys along the route was reported to have been mostly clear, with cloud on the mountains

1.8 AIDS TO NAVIGATION

The aircraft was equipped with a Global Positioning System receiver.

1.9 COMMUNICATIONS

There was no record of communication with the aircraft during the flight.

1.10 AERODROME INFORMATION

Not relevant to this accident.

1.11 FLIGHT RECORDERS

The aircraft was not equipped with a flight data recorder or a cockpit voice recorder. Neither recorder was required by Indonesian regulation.

1.12 WRECKAGE AND IMPACT INFORMATION

The aircraft was inverted at impact. The engine, propeller, cockpit, and cabin were destroyed by the impact forces and the post-impact fire. Both wings were substantially damaged. The outboard section of the left wing was destroyed. Both main landing gear assemblies were destroyed, but the tail wheel assembly was not damaged.

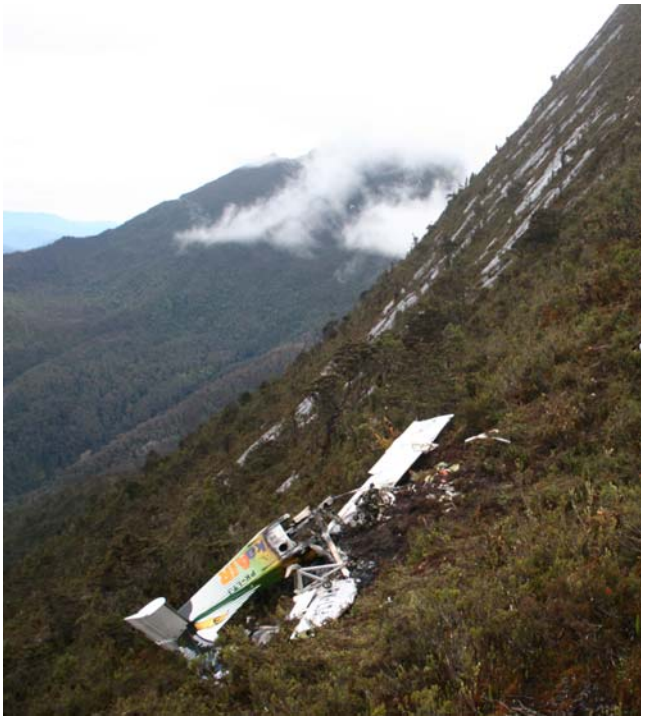

Figure 2: View along slope of Mt Gergaji

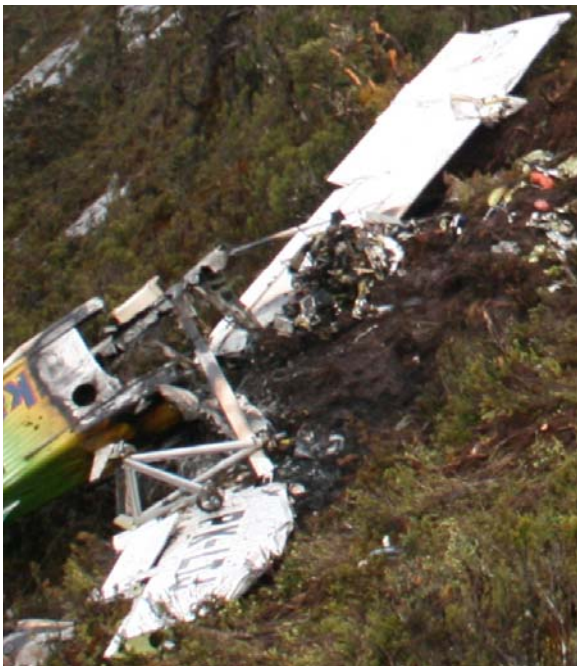

Figure 3: Destroyed forward fuselage and wings at the completion of on-site activities

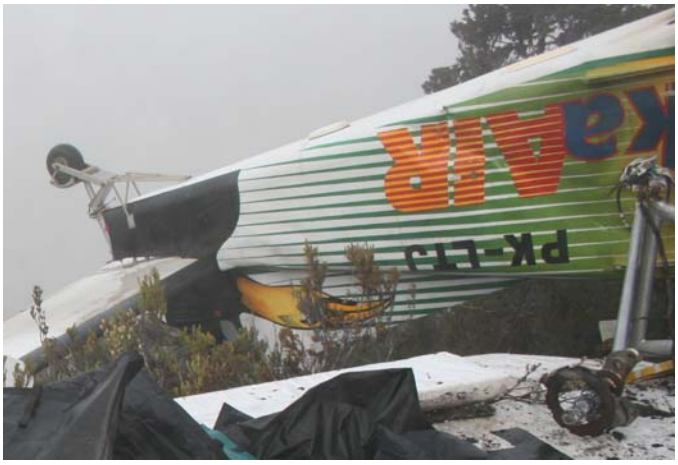

Figure 4: Inverted rear fuselage showing undamaged tail wheel

1.13 MEDICAL INFORMATION

Due to the remote location of the substantially fire-damage wreckage, and the time taken to effect recovery of the fatally injured occupants, medical examinations were not conducted.

1.14 FIRE

A post-impact fire destroyed the cabin and forward fuselage.

1.15 SURVIVAL ASPECTS

Not relevant to this accident.

1.16 TESTS AND RESEARCH

Not relevant to this accident.

1.17 ORGANISATIONAL AND MANAGEMENT INFORMATION

Aircraft Owner : Mimika Local Government

Aircraft Operator : PT. Mimika Air
Terminal Building 2nd Floor
Halim Perdanakusuma Airport
Jakarta 13610
Republic of Indonesia

Air Operator Certificate Number : AOC/135-007

1.18 ADDITIONAL INFORMATION

1.18.1 Air Operator Certificate

The Air Operator Certificate (AOC) Proving Test Plan as part of the Air Carrier Certification process, dated 28 November 2008, stated at page 58:

> Knowledge of en-route structure, long-range navigation procedures (if applicable), and unique en route and area-of-operation requirements
>
> - Need more familiarization on en-route procedures.
> - Each pilots must conduct 150 hours route training.

1.18.2 Ilaga to Mulia route

The direct track from Ilaga to Mulia passed over a mountain range, with a high peak adjacent to, and west of the track at about the midway point, at 13,700 feet. A low route between the two aerodromes would have required the pilot to navigate visually to the west of the direct track, around the high peak. Pilots familiar with the route and aircraft type informed the investigation that it was not possible for a Pilatus Porter aircraft to depart from Ilaga and climb over Mt Gergaji on the direct track to Mulia, without a series of circling flight. If climbing circling flight were executed, the time interval between Ilaga and Mulia would be considerably longer than the 18 minutes planned by the pilot.

1.18.3 Communication Issues

As stated in Section 1.9, there was no record of communication with the aircraft during the flight. The investigation obtained documentation indicating that the pilot had a history of not complying with Aerodrome Flight Information Service (AFIS) reporting requirements.

1.18.4 Pilot licence; validation of foreign licence

In accordance with ICAO Annex 1, Paragraph 1.2.2.1, the Validation of a Certificate issued against a foreign pilot licence becomes invalid, once the licence against which it is issued expires.

1.19 USEFUL OR EFFECTIVE INVESTIGATION TECHNIQUES

The investigation was conducted in accordance with NTSC-approved policies and procedures, and in accordance with the standards and recommended practices of Annex 13 to the Chicago Convention.

2 ANALYSIS

There were no witnesses to the accident.

The pilot was operating under visual flight rules procedures for the flight from Ilaga to Mulia. This required him to remain clear of cloud. Investigators were unable to conclusively determine the circumstances leading to the accident. However, from the wreckage they determined that it was likely that the pilot had flown the aircraft into cloud and lost control of the aircraft in instrument meteorological conditions. The impact signature was consistent with uncontrolled flight at the time of impact. This probably resulted from the pilot becoming spatially disoriented after entering cloud.

The location of the accident was not on the route normally flown between Ilaga and Mulia. Due to the height of the terrain on the direct track, and the short time interval between the two aerodromes, the direct track was not normally flown in the Pilatus Porter aircraft. The reason the pilot was flying on the direct track could not be determined.

The investigation was unable to determine the number of hours flown by this pilot over the route. It is likely, that due to the short time the pilot had been with Mimika Air, he had not met the Directorate General of Civil Aviation route familiarization requirements noted in the Air Operators Certificate, Proving Test Plan; 150 hours route training.

The pilot was operating on a license validation issued by the Directorate General of Civil Aviation, based on his Myanmar Commercial Pilot License (CPL). The pilot's Validation Certificate had an expiry date of 11 June 2009, and his Myanmar CPL had an expiry date of 19 April 2009. While technically valid at the time of the accident, the Validation Certificate was incorrectly issued and would have become invalid after 19 April 2009, because it could only remain valid during the period of validity of the Myanmar license.

3 CONCLUSIONS

3.1 FINDINGS

- The pilot was appropriately licensed at the time of the accident. However, the license Validation Certificate would have become invalid 2 days after the accident, when his Myanmar Commercial Pilot License expired.
- It is likely that the pilot had not completed the Directorate General of Civil Aviation route familiarization requirements stipulated in the Air Operator Certificate documentation.
- The route flown by the pilot was the direct track. This indicated that he may have been using Global Positioning System tracking guidance.
- There was cloud along the mountain range that crossed the aircraft's track.
- The wreckage indicated that the aircraft impacted the steep slope of Mt Gergaji in an inverted attitude.
- It is likely the pilot became spatially disoriented after entering cloud, and lost control of the aircraft.
- The aircraft had no recorded defects before the accident.

3.2 CAUSES

The pilot may not have had adequate knowledge of the route and weather conditions, and may have been relying on Global Positioning System navigation, and was attempting to climb on the direct track over Mt Gergaji.

It was likely that the pilot became spatially disoriented after entering cloud while operating under visual flight procedures, leading to a loss of control and uncontrolled impact with terrain..

4 SAFETY ACTIONS AND RECOMMENDATIONS

4.1 SAFETY ACTIONS

At the time of writing the Draft Report, the National Transportation Safety Committee had not been informed of any safety actions resulting from this accident.

4.2 RECOMMENDATIONS

As a result of the investigation into the accident involving Pilatus PC-6/B2-H4 Turbo Porter aircraft, registered PK-LTJ, on Mt Gergaji, Papua, on 17 April 2008, the National Transportation Safety Committee issues the following recommendations to address safety issues identified in this report.

4.2.1 Recommendation to Directorate General of Civil Aviation (DGCA)

The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation review the training and checking requirements for pilots operating in remote and mountainous regions such as Papua.

- Particular attention should be given to visual flight operations in mountainous and unpredictable weather conditions. This should include intensive route and aerodrome familiarization in locations, and over routes, where aids such as EGPWS[3], TAWS[4], GPS[5], and Radio Altimiter[6] are not effective, are not practical, or are not available.

The following definitions were taken from The Cambridge Aerospace Dictionary.

3 EGPWS – Enhanced ground proximity warning system. Provides predictive terrain-hazard warnings. Uses aircraft flight data to calculate envelope along projected flight path and compare this with internal terrain data base. Potential conflict gives aural warning and also displays terrain map showing clearance ahead.

4 TAWS – Terrain awareness and warning system. Provides predictive terrain-hazard warnings. See EGPWS.

5 GPS – Global positioning system. Worldwide system in which users derive their location by interrogating four satellites from a total net of 24.

6 Radio altimeter – Instrument giving a readout of height above ground level by time varying frequency and measuring the difference in frequency of received waves, this being proportional to time and hence to height.

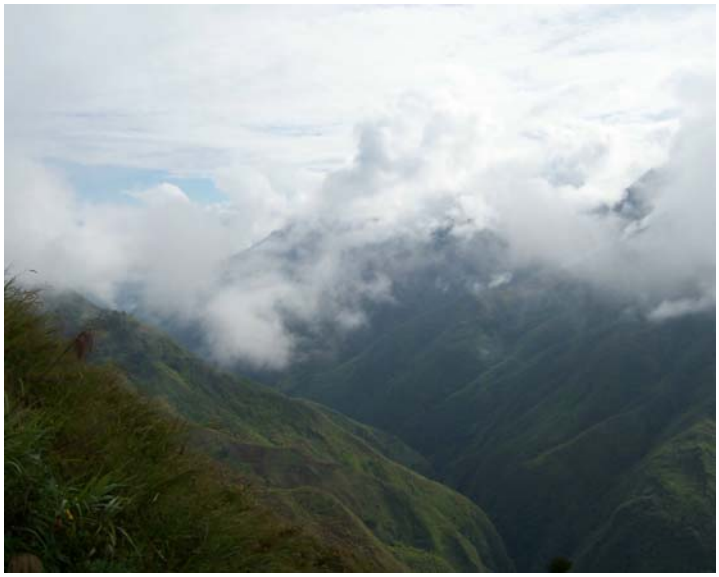

Figure 5: Typical of lightly clouded mountain valleys in Papua

Figure 6: Short, high altitude airstrip in cloud filled mountain valley

Figure 7: Typical high altitude, valley system with steep sloping airstrip

Figure 8: Typical jungle airstrip wedged in between mountains

4.2.2 Recommendation to Directorate General of Civil Aviation (DGCA)

The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation review licence validation procedures to ensure they meet the ICAO Annex 13 Para 1.2.2.1 Standard.