

PRELIMINARY
KNKT.09.08.21.04

NATIONAL
TRANSPORTATION
SAFETY
COMMITTEE

Aircraft Accident Investigation Report

PT. Merpati Nusantara Airline
De Haviland DHC6 Twin Otter; PK-NVC
Near Ambisil / Okbibab, PAPUA
Republic of Indonesia

2 August 2009



NATIONAL TRANSPORTATION SAFETY COMMITTEE
MINISTRY OF TRANSPORTATION
REPUBLIC OF INDONESIA
2009

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TABLE OF CONTENTS

TABLE OF CONTENTS	ii
FIGURES.....	iv
GLOSSARY OF ABBREVIATIONS	v
INTRODUCTION	1
1 FACTUAL INFORMATION	2
1.1 History of the flight.....	2
1.2 Injuries to persons	3
1.3 Damage to aircraft	3
1.4 Other damage	3
1.5 Personnel information.....	4
1.5.1 Pilot in command	4
1.5.2 Copilot	4
1.6 Aircraft information.....	5
1.6.1 Aircraft data	5
1.6.2 Engines.....	5
1.6.3 Propellers	5
1.6.4 Weight and Balance (W&B).....	6
1.7 Meteorological information	6
1.8 Aids to navigation.....	6
1.9 Communications	6
1.10 Aerodrome information	6
1.11 Flight recorders.....	6
1.12 Wreckage and Impact Information	7
1.13 Medical and Pathological Information.....	8
1.14 Fire.....	8
1.15 Survival Aspects	8
1.16 Tests and Research.....	8
1.17 Organisational and Management Information	8
1.18 Additional Information	9
1.19 Useful or effective investigation Technique.....	9

FIGURES

Figure 1: A de Havilland DHC-6 Twin Otter similar to PK-NVC	2
Figure 2: Cockpit Voice Recorder from Twin Otter PK-NVC	7
Figure 3: Wreckage of Twin Otter PK-NVC	7

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 Sunday, 2 August 2009, a de Havilland DHC-6 Twin Otter aircraft, registered PK-NVC, operated by PT. Merpati Nusantara Airlines as flight number MZ-7960D, departed from Sentani Airport, Jayapura for Oksibil Airport. The flight was planned in accordance with the visual flight rules (VFR). There were 15 persons on board; two pilots, one engineer, 10 adult passengers and two infants.

The estimated flight time was 50 minutes. The fuel on board was sufficient for 2 hours and 50 minutes flight time.

About 15 minutes prior to the estimated time of arrival at Oksibil the crew of another aircraft informed the Twin Otter crew that the weather in the Oksibil area was partly cloudy. There were no further reports of radio transmissions from the Twin Otter, and it did not arrive at Oksibil.

A search was initiated at the time the aircraft would have run out of fuel. On the morning of 4 August 2009, searchers located the wreckage of the Twin Otter at an elevation of about 9,300 feet about 6 Nm from Oksibil. The aircraft was destroyed by impact forces, and all of the occupants were fatally injured.

The investigation is continuing and will include an analysis of the CVR, flight crew records, and operational regulations and procedures, particularly with respect to training and checking requirements for pilots operating in the remote and mountainous regions of Papua.

1 FACTUAL INFORMATION

1.1 HISTORY OF THE FLIGHT

On Sunday, 2 August 2009, a de Havilland DHC-6 Twin Otter aircraft, registered PK-NVC, operated by PT. Merpati Nusantara Airlines as flight number MZ-7960D, departed from Sentani Airport, Jayapura¹ to Oksibil Airport. The flight was planned in accordance with the visual flight rules (VFR). There were 15 persons on board; two pilots, one engineer, 10 adult passengers and two infants.

The accident flight was the second flight for the day over the route in PK-NVC for this crew. The first flight departed Sentani at 0650 local time (2150 Coordinated Universal Time (UTC)²). The crew returned to Sentani at 0035. Prior to landing at Sentani, the Pilot in Command (PIC) contacted the company via very high frequency (VHF) radio and asked for a quick turn around, because of the weather on the route, and the possibility that cloud might block the gap into Oksibil.

The second flight departed Sentani at 0115, and was scheduled to arrive at Oksibil at 0205. The fuel on board was sufficient for 2 hours and 50 minutes flight time.



Figure 1: A de Havilland DHC-6 Twin Otter similar to PK-NVC

¹ Sentani Airport, Jayapura - Papua, will be called as Sentani for the purpose of this report.

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.

The Twin Otter crew communicated with the crew of an Indonesian Air Force aircraft flying from Oksibil to Sentani, and said that they were 100 miles from Jayapura, en-route to Oksibil. The Air Force pilot reported that the weather on the mountains was cloudy, and suggested that they should take the route from Oksibil to Sentani, via Kiwirok on the way back to Sentani. The Air Force pilot also informed them that that the weather in the Oksibil area was partly cloudy.

There were no further reports of radio transmissions from the Twin Otter, and it did not arrive at Oksibil.

A search was initiated at 0405 on 2 August 2009, the time the aircraft would have run out of fuel. On 4 August 2009, at about 2120, searchers located the wreckage of the Twin Otter at an elevation of about 9,300 feet. The location 04° 42'.25" S, 140° 36'.84" E was approximately 2.8 Nm from District Abmisibil³, the nearest district, or about 6 Nm from Oksibil.

The occupants were fatally injured.

1.2 INJURIES TO PERSONS

Table 1: Injuries to persons

Injuries	Flight crew	Passengers	Total in Aircraft	Others
Fatal	2	13	15	-
Serious	-	-	-	-
Minor	-	-	-	Not applicable
Nil Injuries	-	-	-	Not applicable
TOTAL	2	13	15	-

1.3 DAMAGE TO AIRCRAFT

The aircraft was destroyed by the impact forces.

1.4 OTHER DAMAGE

Trees in the forest were damaged during the impact.

³ District Abmisibil also known as Okbibab will be called as Abmisibil for the purpose of this flight.

1.5 PERSONNEL INFORMATION

1.5.1 Pilot in command

Gender : Male
Date of birth : 4 November 1972
Nationality : Indonesia
License : ATPL
Date of issue : 10 May 2005
Valid to : 23 December 2009
Aircraft type rating : DHC 6 Twin Otter
Medical certificate : First Class
Date of medical : 1 July 2009
Valid to : 1 January 2010
Last proficiency check : 25 April 2009
Total hours : 8,387.20 Hrs
This make and model : 8,387.20 hrs
Last 90 days : 181 hrs
Last 7 days : 16 hours 35 minutes
Last 24 hours : 2 hrs, 50 minutes
This flight : 55 minutes

1.5.2 Copilot

Gender : Male
Date of birth : 11 December 1971
Nationality : Indonesia
License : CPL
Date of issue : 30 January 1997
Valid to : 11 November 2009
Aircraft type rating : DHC 6 Twin Otter
Medical certificate : First Class
Date of medical : 11 May 2009
Valid to : 11 November 2009

Last proficiency check : 10 May 2009
Total hours : 1,207 Hrs
This make and model : 1,207 Hrs
Last 90 days : 188.20 Hrs
Last 7 days : 16 hours 35 minutes
Last 24 hours : 2 hours 50 minutes
This flight : 55 minutes

1.6 AIRCRAFT INFORMATION

1.6.1 Aircraft data

Aircraft manufacturer : De Haviland Canada
Aircraft model/type : DHC 6 Twin Otter
Serial number : 626
Year of manufacture : 1977
Aircraft registration : PK- NVC
Certificate of registration : 2334
Valid to : 10 November 2011
Certificate of airworthiness : 2512
Valid to : 30 August 2009
Total hours since new : 27,336.45 Hours

1.6.2 Engines

Engine type : Turbo Propeller
Manufacturer : Pratt & Whitney Canada
Model : PT6A-27

1.6.3 Propellers

Propeller type : Variable Pitch Propeller
Manufacturer : Hartzell
Model : HC-B3TN-3DY

1.6.4 Weight and Balance (W&B)

Not verified at the time of writing this Preliminary Report.

1.7 METEOROLOGICAL INFORMATION

The weather in the area of the flight was reported to have been mostly clear in the valleys, with cloud on the mountains and slopes.

1.8 AIDS TO NAVIGATION

The aircraft was equipped with a Global Positioning System receiver.

1.9 COMMUNICATIONS

Communications on VHF radio between the Twin Otter and an Indonesian Air Force aircraft about 35 minutes after departure from Sentani were normal.

1.10 AERODROME INFORMATION

Not relevant to this accident.

1.11 FLIGHT RECORDERS

The aircraft was not equipped with flight data recorder (FDR). Indonesian regulations did not require a FDR to be fitted to the Twin Otter aircraft.

The aircraft was equipped with a Cockpit Voice Recorder (CVR). Search and Rescue personnel recovered the CVR from the wreckage and handed it over to NTSC investigators. The outer box had minor damage, but the contents were not damaged.



Figure 2: Cockpit Voice Recorder from Twin Otter PK-NVC

1.12 WRECKAGE AND IMPACT INFORMATION



Figure 3: Wreckage of Twin Otter PK-NVC

The aircraft struck trees before it impacted the ground. The wings separated from the fuselage as it struck the trees. The aircraft was severely disrupted and fragmented by the impact forces.

1.13 MEDICAL AND PATHOLOGICAL INFORMATION

Not available at the time of writing this Preliminary Report.

1.14 FIRE

There was no pre- or post-impact fire.

1.15 SURVIVAL ASPECTS

Crews of search aircraft reported that no signals were heard from the aircraft's Emergency Locator Transmitter (ELT) signal on the radio frequencies 243 Mhz and 121.5 Mhz.

During the afternoon of 3 August, local villagers from Abmisibil informed search personnel that they had seen the aircraft fly over them. This assisted the searchers, and the wreckage was located at about 0620 LT on 4 August.

The ELT was found in the wreckage by search personnel, who gave it to the NTSC investigators.

The accident was not survivable.

1.16 TESTS AND RESEARCH

Not relevant to this accident.

1.17 ORGANISATIONAL AND MANAGEMENT INFORMATION

Aircraft Owner :

Aircraft Operator : PT. Merpati Nusantara Airlines
Jalan Angkasa Blok B 15, Kavling 2-3
Kemayoran
Jakarta 172
Republic Indonesia

Air Operator Certificate Number: AOC/121-002

1.18 ADDITIONAL INFORMATION

The investigation is continuing and will include an analysis of the CVR, flight crew records, and operational regulations and procedures, particularly with respect to training and checking requirements for pilots operating in the remote and mountainous regions of Papua.

1.19 USEFUL OR EFFECTIVE INVESTIGATION TECHNIQUE

The investigation is being 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.