PRELIMINARY
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NATIONAL TRANSPORTATION SAFETY COMMITTEE

Aircraft Accident Investigation Report

PT. Merpati Nusantara Airlines

Xi An MA60; PK-MZK

Utarom Airport, Kaimana - Papua Barat
Republic of Indonesia

07 May 2011

NATIONAL TRANSPORTATION SAFETY COMMITTEE
MINISTRY OF TRANSPORTATION
REPUBLIC OF INDONESIA
2011

This Preliminary Factual Report was produced by the National Transportation Safety Committee (NTSC), Transportation Building 3rd Floor, Jalan Medan Merdeka Timur No. 5, Jakarta 10110, Indonesia.

The report is based upon the initial investigation carried out by the NTSC in accordance with Annex 13 to the Convention on International Civil Aviation, Aviation Act (UU No.1/2009), and Government Regulation (PP No. 3/2001).

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GLOSSARY OF ABBREVIATIONS

AD	:	Airworthiness Directive
AFIS	:	Aerodrome Flight Information Service
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
Avsec	:	Aviation Security
BMKG	:	*Badan Meteorologi Klimatologi dan Geofisika* / Meteorological Climatological and Geophysical Agency
BOM	:	Basic Operation Manual
°C	:	Degrees Celsius
CAAC	:	Civil Aviation Administration of China
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
FSS	:	Flight Service Sector
GPWS	:	Ground Proximity Warning System
hPa	:	Hectopascals

Hr	:	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)
KNKT / NTSC	:	*Komite Nasional Keselamatan Transportasi* / National Transportation Safety Committee
PIC	:	Pilot in Command
P/N	:	Part Number
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 7 May 2011, a Xi An MA60 aircraft registered PK-MZK was being operated by PT. Merpati Nusantara Airline as a scheduled passenger flight MZ 8968, from Domine Eduard Osok Airport, Sorong, Papua Barat to Utarom Airport, Kaimana, Papua Barat.

The accident flight was part of series of flight scheduled for crew and aircraft which started from Jayapura to Nabire (MZ 8234), Nabire to Kaimana and Sorong (MZ 8967), and Sorong to Kaimana and Nabire (MZ 8968), and finally from Nabire to Biak (MZ 8019).

The time of departure and arrival of the above mentioned route are as follows: Jayapura to Nabire (MZ 8234 departure 22:30 UTC[1] arrival 00:15 UTC), Nabire to Kaimana (MZ 8967 departure 00:50 UTC and arrival 01:30 UTC), Kaimana to Sorong (MZ 8967 departure 01:50 UTC arrival 03:10), and the accident flight was from Sorong to Kaimana (MZ 8968 departure 03:40 and estimated arrival 04:55).

The aircraft's dispatch release from Sorong indicated that the flight was planned under the Instrument Flight Rules (IFR)[2]. The destination, Kaimana, had no published instrument approach procedure. Terminal area operations, including approach and landing, were required to be conducted under the Visual Flight Rules (VFR).

The flight crew was provided by Sorong's dispatcher the actual Kaimana weather information observed at 0300 UTC, indicated that the weather was "precipitation near airport, horizontal visibility of 8 kilometers, cloud broken[3] at 1400 ft, south easterly wind at speed of 6 knots and ground temperature 29°C". The observed weather report was issued by Meteorological Climatological and Geophysical Agency (BMKG) [4] Kaimana.

The analysis of satellite weather image at 04:50 UTC provided to the investigation by BMKG Jakarta indicated that the weather was moderate rain, horizontal visibility of 3,000 meters, cloud cumulonimbus and cumulus broken at 1,300 feet, north easterly wind at speed of 7 knots.

The aircraft departed from Sorong at 0350 UTC[5] and estimated time of arrival at Kaimana at 04.54 UTC. On board in this flight there were 2 pilots, 2 flight attendants, 2 engineers and 19 passengers consisted of 16 adults, 1 child and 2 infants.

The information provided to the investigation by Air Traffic Controller (ATC) Sorong indicated that the flight MZ 8968 en-route airway W-67 at FL 155.

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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. Waktu Indonesia Timur (WIT) is UTC +9 hours.

2 IFR (Instrument Flight Rules) Rules which allow properly equipped aircraft to be flown under Instrument Meteorological Condition (IMC).

3 Broken is the amount of cloud when the sky is covered by cloud between 4/8 up to 6/8 part.

4 BMKG (Badan Meteorologi Klimatologi dan Geofisika, Meteorological Climatological and Geophysical Agency) is the Indonesia meteorology office.

5 The 24-hour clock in Coordinated Universal Time (UTC) is used in this report to describe the local time as specific events occurred. Waktu Indonesia Timur (WIT) is UTC +9 hours. Therefore, 0445 UTC on 7 May 2011 was 1345 local Kaimana time.

At about 0402 UTC the MZ 8968 established contact with Biak FSS (Flight Service Sector).

At about 0425 UTC, after passing waypoint JOLAM the MZ 8968 contacted Kaimana Radio informed that the estimated time of arrival would be 04.54 UTC. The Kaimana AFIS (Aerodrome Flight Information Service) officer informed that the weather at Kaimana was raining, horizontal visibility of 3 up to 8 kilometers, cloud Cumulonimbus broken at 1500 ft, south westerly wind at speed of 3 knots, and ground temperature 29°C.

At about 0430 UTC, the flight crew reported that the MZ 8968 was descending and was instructed to call when the position at 5 minutes out.

At about 0442 UTC the flight crew reported that the MZ 8968 was at 7 Nm from the airport and was descending passed 8000 feet. The flight crew also asked about the rain and decided to fly to south area.

At about 0445 UTC the flight crew reported that the MZ 8968 was holding at 15 Nm south of airport at 5000 feet. The AFIS officer informed that the airport was still raining and ground visibility 2 kilometer.

The last communication with the MZ 8968 occurred at about 0450 UTC. The flight crew asked whether any changing in ground visibility and the AFIS officer informed that the ground visibility remain at 2 kilometer and the AFIS officer could see the beginning of runway 01.

The accident site was about 800 meters south west of the beginning of runway 01 or 550 meters from the coastline. The position of main wreckage is Latitude 03° 39’ 8” S; Longitude 133° 41’ 15” E. Most of the wreckages were submerged at the shallow sea between 7 down to 15 meter deep.

The AFIS officer who was off duty received a phone call from a witness informed that there was an accident involving Merpati’s aircraft. The AFIS officer on duty could not see the accident site since it was blocked by trees.

There were four personnel of the airport rescue and fire fighting deployed to the coastline near the beginning Runway 01, followed by one ambulance, eight security personnel and ten airport personnel.

All 25 occupants were fatally injured. The aircraft was destroyed.

1 ACTUAL INFORMATION

1.1 HISTORY OF THE FLIGHT

On 7 May 2011, a Xi An MA60 aircraft registered PK-MZK was being operated by PT. Merpati Nusantara Airline as a scheduled passenger flight MZ 8968, from Domine Eduard Osok Airport, Sorong, Papua Barat to Utarom Airport, Kaimana, Papua Barat.

Figure 1 The Xian MA60 aircraft registration PK-MZK

The accident flight was part of series of flight scheduled for crew and aircraft which started from Jayapura to Nabire (MZ 8234), Nabire to Kaimana and Sorong (MZ 8967), and Sorong to Kaimana and Nabire (MZ 8968), and finally from Nabire to Biak (MZ 8019).

The time of departure and arrival of the above mentioned route are as follows: Jayapura to Nabire (MZ 8234 departure 2230 UTC arrival 0015 UTC), Nabire to Kaimana (MZ 8967 departure 0050 UTC and arrival 0130 UTC), Kaimana to Sorong (MZ 8967 departure 0150 UTC arrival 0310), and the accident flight was from Sorong to Kaimana (MZ 8968 departure 0340 and estimated arrival 0455).

The aircraft's dispatch release from Sorong indicated that the flight was planned under the Instrument Flight Rules (IFR). The destination, Kaimana, had no published instrument approach procedure. Terminal area operations, including approach and landing, were required to be conducted under the Visual Flight Rules (VFR).

The flight crew was provided by Sorong's dispatcher the actual Kaimana weather information observed at 0300 UTC, indicated that the weather was "precipitation

near airport, horizontal visibility of 8 kilometers, cloud broken[6] at 1400 ft, south easterly wind at speed of 6 knots and ground temperature 29°C". The observed weather report was issued by Meteorological Climatological and Geophysical Agency (BMKG) Kaimana.

The analysis of satellite weather image at 0450 UTC provided to the investigation by BMKG Jakarta indicated that the weather was moderate rain, horizontal visibility of 3000 meters, cloud cumulonimbus and cumulus broken at 1300 ft, north easterly wind at speed of 7 knots.

The aircraft departed from Sorong at 0350 UTC[7] and estimated time of arrival at Kaimana at 04.54 UTC. On board in this flight there were 2 pilots, 2 flight attendants, 2 engineers and 19 passengers consisted of 16 adults, 1 child and 2 infants.

The information provided to the investigation by Air Traffic Controller (ATC) Sorong indicated that the flight MZ 8968 en-route airway W-67 at FL 155.

At about 0402 UTC the MZ 8968 established contact with Biak FSS (Flight Service Sector).

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At about 0430 UTC, the flight crew reported that the MZ 8968 was descending and was instructed to call when the position at 5 minutes out.

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At about 0445 UTC the flight crew reported that the MZ 8968 was holding at 15 Nm south of airport at 5000 feet. The AFIS officer informed that the airport was still raining and ground visibility 2 kilometer.

The last communication with the MZ 8968 occurred at about 0450 UTC. The flight crew asked whether any changing in ground visibility and the AFIS officer informed that the ground visibility remain at 2 kilometer and the AFIS officer could see the beginning of runway 01.

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6 Broken is the amount of cloud when the sky is covered by cloud between 4/8 up to 6/8 part.

7 The 24-hour clock in Coordinated Universal Time (UTC) is used in this report to describe the local time as specific events occurred. Waktu Indonesia Timur (WIT) is UTC +9 hours. Therefore, 0445 UTC on 7 May 2011 was 1345 local Kaimana time.

8 AFIS (Aerodrome Flight Information Services) is an Air Traffic Communication Services provide information services only.

The accident site was about 800 meters south west of the beginning of runway 01 or 550 meters from the coastline. The position of main wreckage is Latitude 03° 39’ 8” S; Longitude 133° 41’ 15” E. Most of the wreckages were submerged at the shallow sea between 7 down to 15 meter deep.

Figure 2 The Accident Site

The AFIS officer who was off duty received a phone call from a witness informed that there was an accident involving Merpati’s aircraft. The AFIS officer on duty could not see the accident site since it was blocked by trees.

There were four personnel of the airport rescue and fire fighting deployed to the coastline near the beginning Runway 01, followed by one ambulance, eight security personnel and ten airport personnel.

All 25 occupants were fatally injured. The aircraft was destroyed.

1.2 INJURIES TO PERSONS

Injuries	Flight crew	Passengers	Total in Aircraft	Others
Fatal	4	21	25	-
Serious	-	-	-	-
Minor	-	-	-	Not applicable
Nil Injuries	-	-	-	Not applicable
TOTAL	4	21	25	-

All the passengers and crew were citizens of Indonesia.

1.3 DAMAGE TO AIRCRAFT

The aircraft was destroyed and submerged in the sea.

1.4 OTHER DAMAGE

There was no other damage.

1.5 PERSONNEL INFORMATION

1.5.1 Pilot in command

Gender	:	Male
Date of birth	:	19 April 1956
Nationality	:	Indonesia
License	:	ATPL
Date of issue	:	29 January 1983
Valid to	:	23 May 2011
Aircraft type rating	:	Fokker F-100 and MA-60
Medical certificate	:	Class 1, with limitation shall posses glasses that correct for near vision.
Date of medical	:	22 November 2010
Valid to	:	23 May 2011
Last proficiency check	:	12 March 2011
Total hours	:	23,010 hours
Total on type	:	199 hours 5 minutes
Last 90 days	:	120 hours 5 minutes
Last 7 days	:	17 hours 35 minutes
Last 24 hours	:	5 hours 45 minutes
This flight	:	1 hour (approximately)

The first flight of the pilot to Kaimana was performed on 30 April 2011. The accident flight was the fourth flight.

1.5.2 Co-pilot

Gender	:	Male
Date of birth	:	9 September 1974
Nationality	:	Indonesia
License	:	CPL
Date of issue	:	30 July 2007
Valid to	:	31 December 2011

Aircraft type rating	:	MA 60
Medical certificate	:	Class 1, with limitation shall wear corrective lenses
Date of medical	:	20 December 2010
Valid to	:	20 June 2011
Last proficiency check	:	15 December 2010
Total hours	:	370 hours 15 minutes
Total on type	:	234 hours 25 minutes
Last 90 days	:	167 hours 30 minutes
Last 7 days	:	17 hours 35 minutes
Last 24 hours	:	5 hours 45 minutes
This flight	:	1 hour (approximately)

1.6 AIRCRAFT INFORMATION

1.6.1 General

Aircraft manufacturer	:	Xi An Aircraft Industry, China
Aircraft model/type	:	MA 60
Serial number	:	0603
Year of manufacture	:	2007
Aircraft registration	:	PK-MZK
Certificate of Registration	:	2807
Valid to	:	03 March 2014
Certificate of Airworthiness	:	2807
Valid to	:	03 March 2012
TSN	:	615 hours
CSN	:	764 cycles
MTOW	:	21,800 kg
Actual Take Off Weight	:	18,344 kg
Estimated Landing Weight	:	17,645 kg

1.6.2 Engines

Engine type	:	Turbopropeller
Manufacturer	:	Pratt & Whitney, Canada
Model	:	PW 127 J

Serial Number 1	:	PCE-EA0077
TSN	:	615 hours
CSN	:	764 cycles
Serial Number 2	:	PCE-EA0076
TSN	:	615 hours
CSN	:	764 cycles

1.7 METEOROLOGICAL INFORMATION

Weather report for Kaimana (WASK), issued on 7 May 2011, at 0400 UTC:

Surface wind	: 240 / 3 knots
Visibility	: 8 km
Present weather	: precipitation insight
Cloud	: Broken Cumulus and Cumulonimbus, cloud base at 1500 feet. Remark: Cumulonimbus to south west
Temperature	: 28° C
Dew Point	: 23° C
QNH	: 1008.9 mbs
QFE	: 1008.0 mbs

Weather report for Kaimana (WASK), issued on 7 May 2011, at 0500 UTC:

Surface wind	: 060 / 4 knots
Visibility	: 3 km
Present weather	: intermediate moderate rain
Cloud	: Broken, Cumulus and Cumulonimbus, cloud base at 1600 feet
Temperature	: 23° C
Dew Point	: 23° C
QNH	: 1009.2 mbs
QFE	: 1008.1 mbs

Day light condition prevailed at the time of the accident.

1.8 AIDS TO NAVIGATION

There were no navigation aids for the approach and landing at Kaimana. Approach and landing must be conducted under the VFR.

1.9 COMMUNICATIONS

Air traffic communication services provided when operating into Kaimana were advisory only. Direct two-way communication between Kaimana Radio and the crew was established when the flight passing waypoint JOLAM. The last communication was occurred when the flight at 15 Nm south of the airport.

1.10 AERODROME INFORMATION

Aerodrome Code	:	WASK / KNG
Airport Name	:	Utarom Airport
Airport Address	:	Jl. Utarom Kaimana PO. Box 10 Kaimana, Papua Barat 98654
Airport Class	:	III
Airport Authority	:	DGCA
Airport Service	:	AFIS
Type of Traffic Permitted	:	VFR
Coordinates	:	03^{o} 38’ 00” S, 133^{o} 41’ 00’’ E
Elevation	:	10 feet
Runway Length	:	1600 meters
Runway Width	:	30 meters
Azimuth	:	01 – 19

1.11 FLIGHT RECORDERS

The aircraft was equipped with a Flight Data Recorder (FDR) and Cockpit Voice Recorder (CVR).

Flight Data Recorder (FDR)

Manufacturer	:	Shaanxi Qianshan Avionics Co. Ltd., China
Type	:	Solid Stated
P / N	:	FB-30C
S / N	:	0509006

Cockpit Voice Recorder (CVR)

Manufacturer	:	Honeywell, USA
Type	:	Solid Stated
P / N	:	980 – 6022 – 011
S / N	:	CVR 120-09559

Both recorders were recovered from the accident site. The FDR was taken to Civil Aviation Administration of China (CAAC). The FDR contains seven hours of good quality recording. The analysis of the FDR will be mention in the final report.

The CVR was taken to the NTSC laboratory in Jakarta and has been successfully downloaded. The CVR contains two hours of good quality recording. The analysis of the CVR will be mention in the final report.

1.12 WRECKAGE AND IMPACT INFORMATION

The accident site was about 800 meters south west of the beginning of runway 01 or 550 meters from the coastline. Most of the wreckages were submerged at the shallow sea between 7 down to 15 meter deep.

Small parts of the aircraft were recovered from the coast, while four large parts such as two broken fuselages, wings included engine and landing gear, and empennage.

At the time of issued this Preliminary Factual Report, the remaining wreckage are in the process of recovery.

Figure 3 Fuselage a Few Minutes after Impact

1.13 MEDICAL AND PATHOLOGICAL INFORMATION

All aircraft occupants were fatally injured as result of impact during the accident.

1.14 FIRE

There was no evidence of fire in flight or after the aircraft impact.

1.15 SURVIVAL ASPECTS

It was an un-survivable accident.

1.16 TESTS AND RESEARCH

Test and research will be considered as additional factual data indicate the requirement.

1.17 ORGANISATIONAL AND MANAGEMENT INFORMATION

Aircraft Owner	:	PT. Merpati Nusantara Airlines
Address	:	Jl. Angkasa Blok B-15 Kav 2-3
		Kemayoran, Jakarta 10720

The owner address information is based on the aircraft Certificate of Registration.

Aircraft Operator	:	PT. Merpati Nusantara Airlines
Address	:	Jl. Gunung Bawakaraeng No. 109
		Makassar, Sulawesi Selatan
AOC Number	:	AOC 121/002

The operator address information is based on the Operator's Operation Specification.

1.18 ADDITIONAL INFORMATION

The investigation is continuing and will include analysis of the flight data and cockpit voice recorders, and operational documentation and training with respect to stabilized approach criteria and operations into wet and contaminated runways. Runway conditions and safety systems including rescue and fire fighting services, and the system for ensuring flight crews have sufficient and appropriate information to aid their decision making will also be examined. The role of the

aviation regulator in providing appropriate and effective oversight of the operator and aerodrome is being examined.

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

To be included in the final report.

3 CONCLUSION

To be included in the final report.

4 SAFETY ACTIONS

At the time of issuing this Draft Report, the National Transportation Safety Committee had been informed of safety actions resulting from this accident as follows:

4.1 Director General Civil Aviation

Director General Civil Aviation (DGCA) has conducted a special safety audit for PT. Merpati Nusantara Airlines on 13 - 15 May 2011.

4.2. PT. Merpati Nusantara Airlines

PT. Merpati Nusantara Airlines has issued a safety recommendation on 11 May 2011, number DS/V/2011/R-011, as follows:

a. For pilot, to abort the landing if a safe landing cannot be made.

b. Review and follow the Visual Flight Rules (VFR) and follow the minima for instrument approach

c. Review all nine “stabilized approach” criteria;

d. Emphasis the mandatory and simulator training to include wind shear, Crew Resources Management (CRM), Approach Landing Accident Reduction (ALAR) and go around indoctrination.

e. For dispatcher to provide up date weather information and anticipate the possibility of Return To Base (RTB);

f. Preflight, transit and daily inspection should be conducted in accordance with the checklist and shall report any finding immediately to the Maintenance Control Centre.

5 RECOMMENDATION

According to factual information and initial finding, the National Transportation Safety Committee issued the following recommendations to address safety issues identified in this preliminary report

5.1 Recommendation to PT. Merpati Nusantara Airlines

The National Transportation Safety Committee recommends that PT. Merpati Nusantara Airlines to ensure that the operational implementation on VFR landing minima should be conducted in accordance with the requirement

5.2 Recommendation to Director General of Civil Aviation

a. The National Transportation Safety Committee recommends to the Director General of Civil Aviation to review procedure and requirement usage of airport facility such as runway lighting, especially during limited visibility, to improve safety of the flight.

b. The National Transportation Safety Committee recommends to the Director General of Civil Aviation to monitor the recommendation implementation as stated above.