KOMITE NASIONAL KESELAMATAN TRANSPORTASI
REPUBLIC OF INDONESIA

PRELIMINARY

KNKT 23.06.11.04

Aircraft Accident Investigation Report

PT Semuwa Aviasi Mandiri Air

Cessna 208 Caravan; PK-SMW

Mountainous Area Near Mabualem, Papua

Republic of Indonesia

23 June 2023

2023

This Preliminary Report is published by the Komite Nasional Keselamatan Transportasi (KNKT), whose address is on the Transportation Building, 3rd Floor, Jalan Medan Merdeka Timur No. 5 Jakarta 10110, Indonesia.

The report is based upon the investigation carried out by the KNKT. It is in accordance with Annex 13 to the Convention on International Civil Aviation, the Indonesian Aviation Act (UU No. 1/2009) and Government Regulation (PP No. 62/2013).

The preliminary report consists of factual information collected until the preliminary report is published. This report will not include analysis and conclusion.

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Jakarta, 8 November 2023
KOMITE NASIONAL
KESELAMATAN TRANSPORTASI
CHAIRMAN

SOERJANTO TJAHJONO

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ABBREVIATIONS AND DEFINITIONS

AIP	:	Aeronautical Information Publication, issued by Indonesia DGCA
ALA	:	Aerodrome for Light Aircraft
AOC	:	Air Operator Certificate
ATC	:	Air Traffic Control
ATS	:	Air Traffic Service
BASARNAS	:	Badan SAR Nasional (Indonesia Search and Rescue Agency)
BMKG	:	*Badan Meteorologi Klimatologi dan Geofisika* (Bureau of Meteorology, Climatology and Geophysics of Indonesia)
C of A	:	Certificate of Airworthiness
C of R	:	Certificate of Registration
CPL	:	Commercial Pilot License
CVDR	:	Cockpit Voice and Data Recorder
DGCA	:	Directorate General of Civil Aviation
ELT	:	Emergency Locator Transmitter
ETA	:	Estimated Time of Arrival
FOO	:	Flight Operation Officer
HF	:	High Frequency
kg	:	kilograms
KNKT	:	*Komite Nasional Keselamatan Transportasi*. An Independent Investigation Authority of Indonesia, also known as the National Transportation Safety Committee/NTSC)
LT	:	Local Time
Lbs	:	Pound-Mass or Pound. Lbs has been derived from a Roman word Libra; it is represented by ‘lb’ or ‘lbs’. Pound is a Latin word meaning ‘a pound by weight’. One pound is equal to 0.45359237 kg
LUT	:	Local User Terminal. It is a Cospas-Sarsat ground station to catch satellite downlink signals from the Emergency Locator Transmitter (ELT) with a frequency of 406 MHz.
MHz	:	Megahertz
NM	:	Nautical Mile
PF	:	Pilot Flying
PIC	:	Pilot in Command
PM	:	Pilot Monitoring
SIC	:	Second in Command
TAWS	:	Terrain Awareness Warning System
TIBA	:	Traffic Information Broadcast by Aircraft
UTC	:	Universal Time Coordinate

VFR	:	Visual Flight Rules
VHF	:	Very High Frequency

SYNOPSIS

On 23 June 2023, a Cessna 208 Caravan aircraft, registered PK-SMW, was being operated by PT Semuwa Aviasi Mandiri (SAM) Air on a chartered flight for passengers and cargo in Papua, Indonesia. The flight was the fifth flight of the day. The flights of the day scheduled for the aircraft were Sentani Airport (WAJJ) – Mulia Airport (WAJM) – Kobakma Airstrip – Wamena Airport (WAVV) – Elelim Airport (WAVE) – Poik Airstrip – Elelim – Poik – Elelim – Sentani.

The Pilot in Command (PIC) acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot Monitoring (PM). Prior to departure, there was no report of aircraft technical system abnormalities. During the stop at Wamena, the aircraft refueled with 950 lbs, as the fuel was not available at the next stop (Elelim and Poik) until the last destination at Sentani.

At 0153 UTC (1053 LT), in daylight conditions, the aircraft departed Elelim with the destination of Poik and cruised at an altitude of 6,500 feet. On board of the aircraft were two pilots and four passengers, with a total weight of 899 kg, including cargo. The estimated time of arrival (ETA) was 1106 LT. According to the flight plan, the distance between Elelim and Poik is about 15 NM, and it took about 13 minutes of flight.

The flight was monitored using the Spidertrack by the Flight Operation Officer (FOO) at Sentani.

At 1100 LT, the FOO noticed that the aircraft was still visible on the monitor screen but not moving. The FOO considered that the condition was normal because the network connection in Sentani sometimes had problems. About 30 minutes later, the FOO still noticed that the aircraft was not moving and reported it to the Base Manager. The Base Manager contacted several operators in the vicinity to conduct a search for the aircraft based on the last point reported by Spidertracks.

About 1206 LT, one of the operators who conducted the search reported there was no appearance of the aircraft in the area closed to Poik Airstrip. Considering that the fuel endurance was almost 2 hours and that until this time the aircraft was not landing at Poik Airstrip, the ATS issued a DETRESFA message without issuing an INCERFA and ALERFA. Subsequently, the ATS contacted BASARNAS regarding the situation of PK-SMW, and the search and rescue team was assembled.

About 1600 LT, one of the pilots who conducted the search reported there was a spot identified by smoke near the Poik Airstrip, and the pilot did not notice any human movement. The smoke was identified on the ridge of the mountain at the coordinates of 3° 54’ 26.35" S and 139° 25’ 53.08" E, with an elevation of about 5,600 feet. The location was about 9.5 NM from Poik Airstrip on bearing 030° or about 7.5 NM from Elelim Airport on bearing 158°.

The investigation is continuing; should any further relevant safety issues emerge during the investigation, KNKT will immediately bring the issues to the attention of the relevant parties and publish as required.

1 FACTUAL INFORMATION

1.1 History of the Flight

On 23 June 2023, a Cessna 208 Caravan aircraft, registered PK-SMW, was being operated by PT Semuwa Aviasi Mandiri Air (PT SAM Air) on a chartered flight for passengers and cargo in Papua, Indonesia. The flight was the fifth flight of the day. The flights of the day scheduled for the aircraft were Sentani Airport (WAJJ[1]) – Mulia Airport (WAJM) – Kobakma Airstrip – Wamena Airport (WAVV) – Elelim Airport (WAVE[2]) – Poik[3] Airstrip – Elelim – Poik – Elelim – Sentani.

On the first flight of the day, medical examination of body temperature and blood pressure test of both pilots was conducted, with the result of no health problem. Prior to departure, there was no report of aircraft technical system abnormalities.

The Pilot in Command (PIC) acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot Monitoring (PM). During the stop at Wamena, the aircraft refueled with 950 lbs, as the fuel was not available at the next stop (Elelim and Poik) until the last destination at Sentani.

At 0153 UTC[4] (1053 LT), in daylight conditions, the aircraft departed Elelim with the destination of Poik and cruised at an altitude of 6,500 feet. On board of the aircraft were two pilots and four passengers, with a total weight of 899 kg, including cargo. The estimated time of arrival (ETA) was 1106 LT. According to the flight plan, the distance between Elelim and Poik is about 15 NM, and it took about 13 minutes of flight.

The flight was monitored using the Spidertrack by the Flight Operation Officer (FOO) at Sentani.

At 1100 LT, the FOO noticed that the aircraft was still visible on the monitor screen but not moving. The FOO considered that the condition was normal because the network connection in Sentani sometimes had problems.

At 1135 LT, the FOO still noticed that the aircraft was not moving and reported it to the Base Manager. The Base Manager contacted several operators in the vicinity to conduct a search for the aircraft based on the last point reported by Spidertrack.

About 1206 LT, the operators who conducted the search reported there was no appearance of the aircraft in the area closed to Poik Airstrip. Considering that the fuel endurance was almost two hours and until this time the aircraft was not landing at Poik Airstrip, the Air Traffic Service (ATS) issued DETRESFA[5] message without issuing an INCERFA[6] and ALERFA[7]. Subsequently, the ATS contacted BASARNAS regarding the situation of PK-SMW, and the search and rescue team was assembled.

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1 Sentani Airport (WAJJ) will be named as Sentani for the purpose of this report.
2 Elelim Airport (WAVE) will be named as Elelim for the purpose of this report.
3 Poik Airstrip will be named as Poik for the purpose of this report.
4 The 24-hour clock in Universal Time Coordinated (UTC) is used in this report to describe the local time as specific events occurred. Local time is UTC+9 hours.
5 DETRESFA is the code word used to designate a distress phase as described in ICAO Annex 11. The order of the emergency alerting message is INCERFA, ALERFA and DETRESFA.
6 INCERFA is the code word used to designate an uncertainty phase as described in ICAO Annex 11.
7 ALERFA is the code word used to designate an alert phase as described in ICAO Annex 11.

About 1600 LT, one of the pilots who conducted the search reported there was a spot identified by smoke near the Poik Airstrip, and the pilot did not notice any human movement. The smoke was identified on the ridge of the mountain at the coordinates of 3° 54’ 26.35” S and 139° 25’ 53.08” E, with an elevation of about 5,600 ft. The location was about 9.5 NM from Poik on bearing 030° or about 7.5 NM from Elelim on bearing 158°. After recording the situation, the pilot returned to Sentani, and the search and rescue activities were postponed.

1.2 Injury to person

Injuries	Flight crew	Passengers	Total in Aircraft	Others
Fatal	2	4	6	-
Serious	-	-	-	-
Minor	-	-	-	-
None	-	-	-	-
TOTAL	2	4	6	-

All occupants were Indonesian citizens.

1.3 Damage to Aircraft

The aircraft was destroyed.

1.4 Other damage

There was no other damage to property and/or the environment reported.

1.5 Personnel Information

1.5.1 Pilot in Command (PIC)

The PIC is an Indonesian who held a valid Commercial Pilot License (CPL) and is qualified as a single-engine land aircraft pilot. The PIC also held a valid First-Class medical certificate with no limitation. The last proficiency check for the PIC was conducted on 17 January 2023.

The PIC had a total flying hour of 4,360 hours, including 4,250 hours on Cessna 208B aircraft in Papua. On the day of the occurrence, the PIC had flown for 4 hours, and in this flight, the PIC had flown for 8 minutes.

1.5.2 Second in Command (SIC)

The SIC is an Indonesian who held valid Commercial Pilot License (CPL) and qualified as single-engine land aircraft pilot. The PIC also held a valid First-Class medical certificate with no limitation. The last proficiency check for the SIC was conducted on 21 September 2022.

The SIC had a total flying hour of 270 hours, including 115 hours on Cessna 208B aircraft. On the day of the occurrence, the SIC had flown for 8 minutes.

1.6 Aircraft Information

The Cessna 208 Caravan, with serial number of 20800609, was manufactured by Cessna Aircraft Company, a United States of America aircraft company, in 2018. The aircraft was registered as PK-SMW and had a valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).

At the day of the occurrence, the aircraft was airworthy when dispatched for the flight and operated within the weight and balance envelope. During the flight, there was no record or report of an aircraft system malfunction.

The aircraft had total hours since new of 4,800 hours and total cycles since new of 6,320 cycles. The engine installed on the aircraft was PT6A-114A, manufactured by Pratt & Whitney Canada with serial number of PCE-19201. The total time since new of the engine was 18,999 hours and the total cycle was 18,810 cycles. The time since overhaul of the engine was 2,514 hours and the cycle since overhaul was 3,045 cycles.

The aircraft was equipped with the Garmin G1000 in which the Terrain Awareness Warning System (TAWS) was available. There was no report of TAWS malfunction prior the flight.

1.7 Meteorological Information

The meteorological station was not available at Poik Airstrip. The weather information was provided by the *Badan Meteorologi Klimatologi dan Geofisika* (BMKG – Bureau of Meteorology, Climatology, and Geophysics). The BMKG provided enhanced infrared and cloud-type satellite images.

Based on the satellite images below, it was shown that the weather around Poik Airstrip was considered clear.

The enhanced infrared satellite images to show the cloud top temperature are as follows:

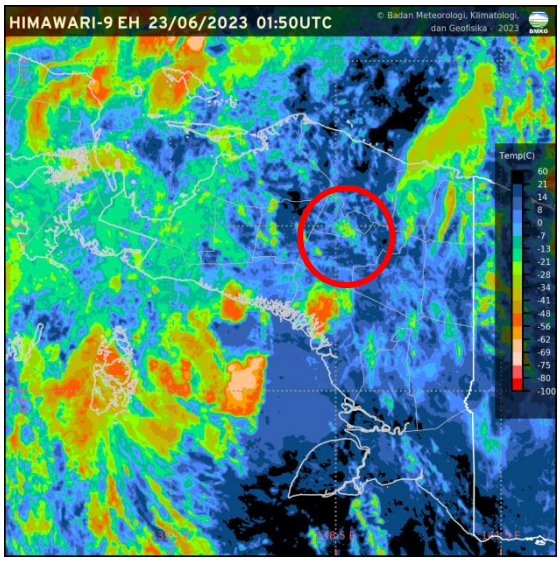


Figure 1: The enhance infrared to show the cloud top temperature on 0150 UTC

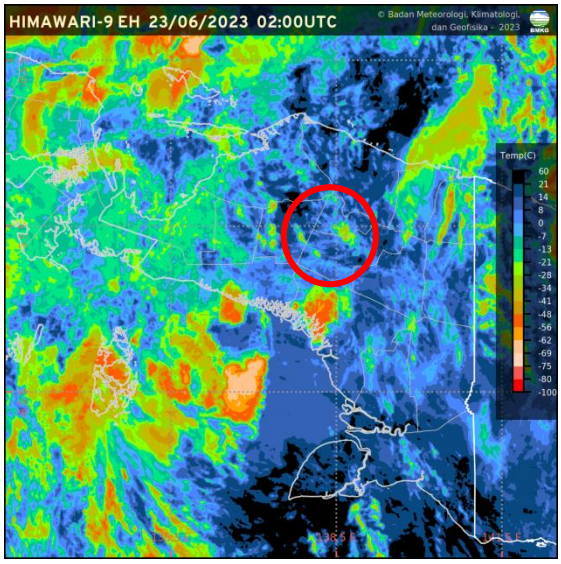


Figure 2: The enhance infrared to show the cloud top temperature on 0200 UTC

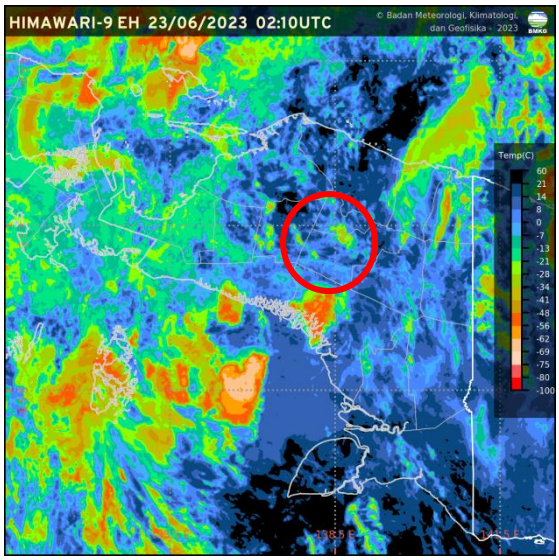


Figure 3: The enhance infrared to show the cloud top temperature on 0210 UTC

The satellite images to show the cloud type are as follows:

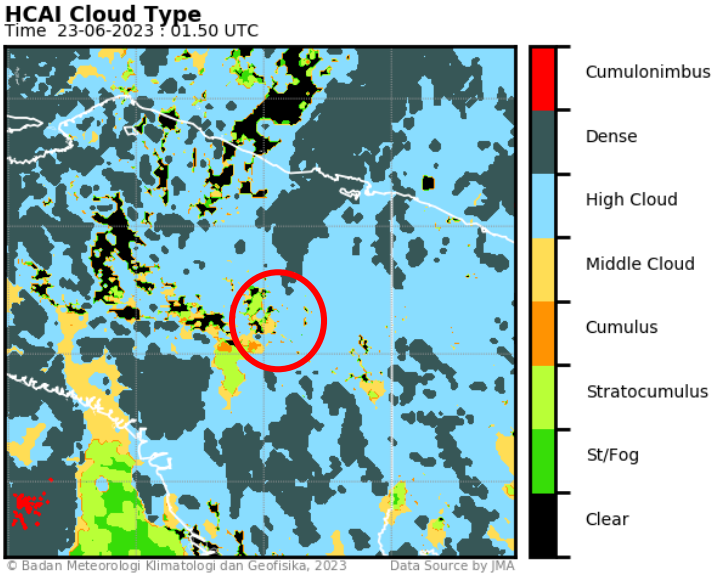


Figure 4: The satellite images to show the cloud type at 0150 UTC

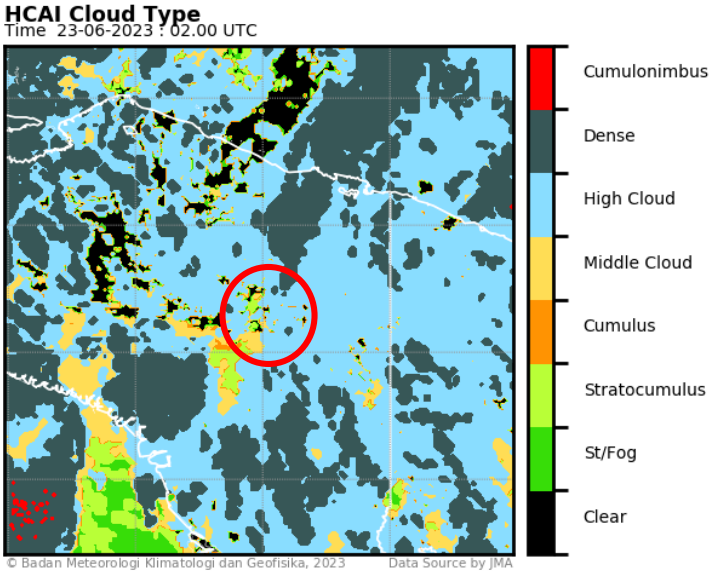


Figure 5: The satellite images to show the cloud type at 0200 UTC

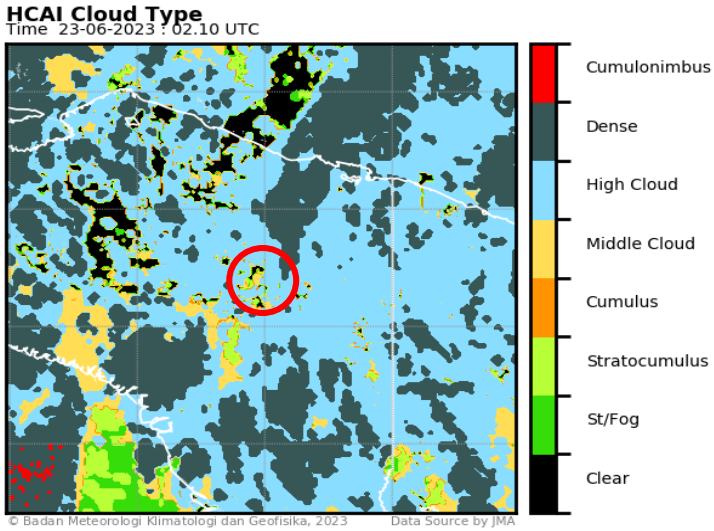
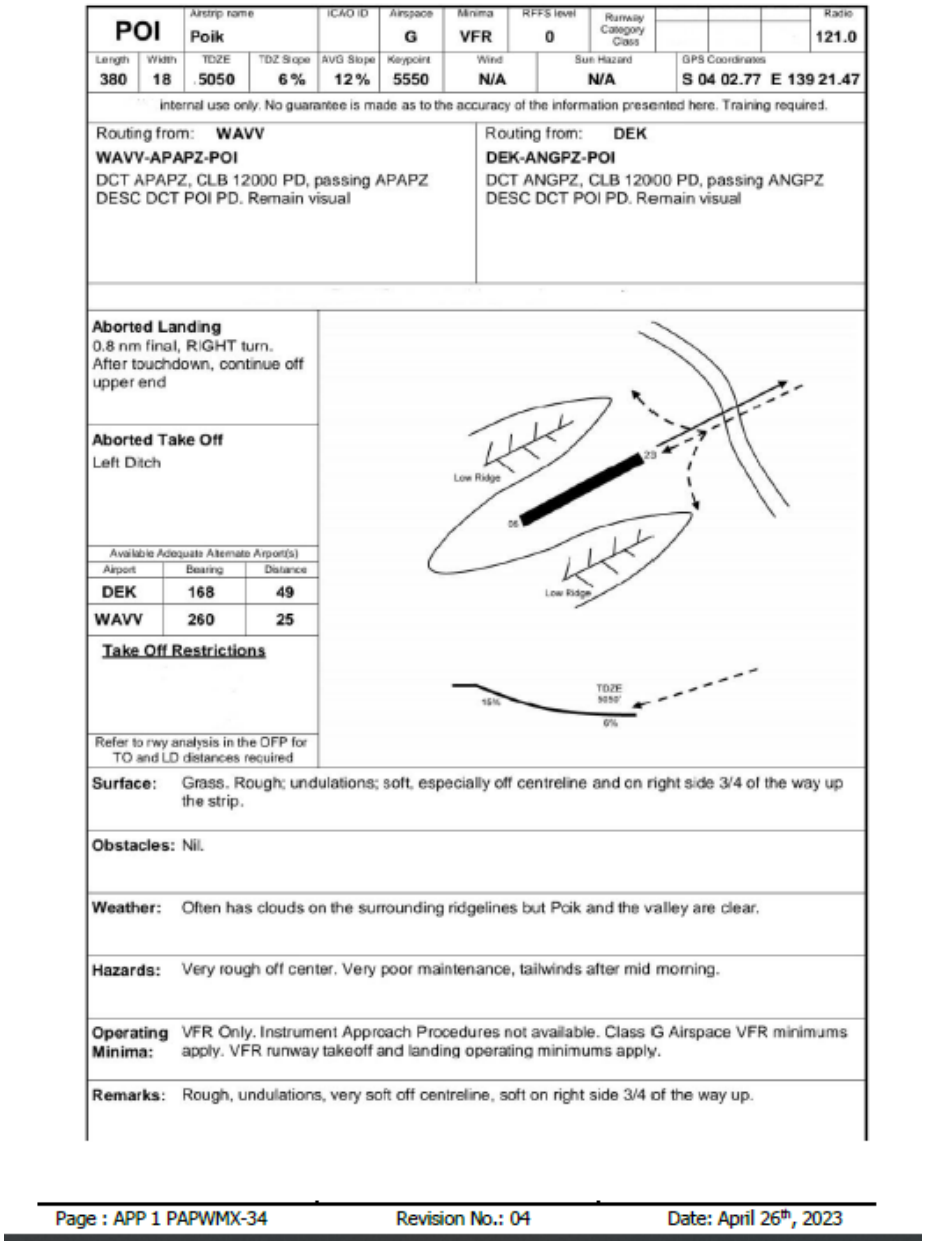


Figure 6: The satellite images to show the cloud type at 0210 UTC

1.8 Aids to Navigation

There was no ground navigation aid available at Poik Airstrip. The Poik Airstrip was not listed on the Aeronautical Information Publication (AIP) Volume IV – Aerodrome for Light Aircraft (ALA) which was issued by the Directorate General of Civil Aviation (DGCA) Indonesia.

The PT SAM Air issued the Route Information for internal use, containing the Poik Airstrip information. The Poik Airstrip information is shown in the figure below.



POI	Airstrip name: Poik	ICAO ID	Airspace: G	Minima: VFR	RFFS level: 0	Runway Category Class	Radio: 121.0

Length	Width	TDZE	TDZ Slope	AVG Slope	Keypoint	Wind	Sun Hazard	GPS Coordinates
380	18	5050	6 %	12 %	5550	N/A	N/A	S 04 02.77 E 139 21.47

internal use only. No guarantee is made as to the accuracy of the information presented here. Training required.

Routing from: **WAVV**
WAVV-APAPZ-POI
DCT APAPZ, CLB 12000 PD, passing APAPZ
DESC DCT POI PD. Remain visual

Routing from: **DEK**
DEK-ANGPZ-POI
DCT ANGPZ, CLB 12000 PD, passing ANGPZ
DESC DCT POI PD. Remain visual

Aborted Landing
0.8 nm final, RIGHT turn.
After touchdown, continue off upper end

Aborted Take Off
Left Ditch

Available Adequate Alternate Airport(s)

Airport	Bearing	Distance
DEK	168	49
WAVV	260	25

Take Off Restrictions

Refer to rwy analysis in the OFP for TO and LD distances required

Surface: Grass. Rough; undulations; soft, especially off centreline and on right side 3/4 of the way up the strip.

Obstacles: Nil.

Weather: Often has clouds on the surrounding ridgelines but Poik and the valley are clear.

Hazards: Very rough off center. Very poor maintenance, tailwinds after mid morning.

Operating Minima: VFR Only. Instrument Approach Procedures not available. Class G Airspace VFR minimums apply. VFR runway takeoff and landing operating minimums apply.

Remarks: Rough, undulations, very soft off centreline, soft on right side 3/4 of the way up.

Figure 7: The Poik Airstrip information

PT SAM Air has a policy to use Runway 05 for takeoff and Runway 23 for landing.

1.9 Communications

The aircraft was equipped with high-frequency (HF) and very-high-frequency (VHF) radio communication systems. The pilot used the VHF radios for routine communication with air traffic control (ATC).

Air traffic service was not available at Poik Airstrip. All aircraft are advised to use Traffic Information Broadcast by Aircraft (TIBA) in the Poik area at a frequency of 121 MHz.

1.10 Aerodrome Information

The Poik airstrip is operated by local villagers. Based on the airfield chart developed by PT SAM Air, the airstrip information is as follows:

Coordinate	: 04°02’46” S 139°21’28” E
Elevation	: 5,050 ft (above mean sea level)
Runway Direction	: 05/23
Runway Length	: 380 meters
Runway Width	: 18 meters
Surface	: grass
Slope	: 12%

1.11 Flight Recorders

The aircraft was equipped with an L3 Harris Cockpit Voice and Data Recorder (CVDR) model FA2100 CVDR with P/N 2100-3083-51 and serial number 001169100.

The CVDR was not found during the search and rescue.

1.12 Wreckage and Impact Information

The aircraft wreckage was found at about 7.8 NM from Elelim Airport on a bearing of 158° with an elevation of about 5,600 feet (yellow-highlighted).

Figure 8: The location of the wreckage on the ridge

Figure 9: The accident site

1.13 Medical and Pathological Information

No medical or pathological investigations were conducted as a result of this occurrence.

1.14 Fire

The evidence of in-flight fire was unknown. There was evidence of burnt vegetation in surrounding the impact area.

1.15 Survival Aspects

About 1135 LT, the Base Manager also contacted the Indonesia Search and Rescue Agency (*Badan SAR Nasional* – BASARNAS) whether the Emergency Locator Transmitter (ELT) was detected by the Local User Terminal (LUT[8]) and it was reported that BASARNAS LUT did not detect the ELT signal. Subsequently, the ATS contacted BASARNAS regarding the situation of PK-SMW, and the search and rescue team was assembled.

About 1600 LT, one of the pilots who conducted the search reported there was a spot identified by smoke near the Poik Airstrip and the pilot did not notice any man movement. The smoke was identified on the ridge of the mountain at the coordinates of 3° 54’ 26.12” S and 139° 26’ 7.3” E, with an elevation of about 5,600 feet. The location was about 9.5 NM from Poik on bearing 030° or about 7.8 NM from Elelim Airport on bearing 158°. After recording the situation, the pilot returned to Sentani, and the search and rescue activities were postponed.

[8] Local User Terminal (LUT) is Cospas-Sarsat ground stations to catch satellite downlink signals of Emergency Locator Transmitter (ELT) with the frequency of 406 MHz. The LUTs then process the signals received from the satellites and calculate the location of a 406 MHz distress beacon alert and displayed to the Search and Rescue display.

On 24 June 2023, the search and rescue team, using a helicopter, departed to the identified location, and the team was dropped near the crash site. The environment of the crash site was dense with vegetation which made the search and rescue team confused about the orientation of the location. The confusion led the team to stay overnight on the mountain.

On 25 June 2023, the search and rescue team found the location of the crash site. The accident was unsurvivable. Due to the weather, the evacuation could not be conducted, and the team stayed overnight near the crash site.

On 26 June 2023 the evacuation still could not be conducted due to the weather, and the team stays another night near the crash site. The evacuation was eventually conducted on 27 June 2023, and all the occupants were sent to Wamena. On the same day, all occupants were transported to Sentani by another aircraft, and subsequently, all occupants were transferred to the hospital at Sentani for identification.

1.16 Tests and Research

Test and research information were not available at the time of the issuance of this preliminary report. Should any test or research information be obtained during this investigation that is relevant to this investigation, it will be included in the final report.

1.17 Organizational and Management Information

The aircraft was operated by PT Semuwa Aviasi Mandiri (SAM) Air, which held a valid operator certificate with an Air Operator Certificate (AOC) number of 135–064. PT SAM Air has two fleets of Cessna 208 Caravan.

PT SAM Air utilizes the flight following system provided by Spidertracks Limited with the type/model Spider 7, which is manufactured in New Zealand. The tracking and flight data from the aircraft were transmitted to the Spidertracks website and monitored by PT SAM Air staff in Sentani.

The aircraft operator subscribed to the Spidertracks flight following system for 2 minutes of interval data reporting for each fleet, including the PK-SMW aircraft. The reporting parameters in the tracking system contained several data, including time, coordinates, aircraft altitude, speed, and bearing. The tracking system begins to send a position report when the device is powered in an open area.

The investigation downloaded the reporting Spidertracks data of the accident flights from Elelim to Poik. The result of the downloaded data will be included in the final report.

1.18 Additional Information

The investigation is continuing, and KNKT plans to complete the investigation within 12 months from the day of the occurrence. Should any further relevant safety issues emerge during the investigation, KNKT will immediately bring the issues to the attention of the relevant parties and publish as required.

1.19 Useful or Effective Investigation Techniques

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

2 FINDINGS

The findings are statements of all significant conditions, events, or circumstances in the accident sequence. The findings are significant steps in the accident sequence, but they are not always causal or indicate deficiencies. Some findings point out the conditions that pre-existed the accident sequence, but they are usually essential to the understanding of the occurrence, usually in chronological order.

In this occurrence, the KNKT identified several findings, as follows:

1. Both pilots held valid licenses and medical certificates.
2. The aircraft had a valid Certificate of Airworthiness (C of A) and a valid Certificate of Registration (C of R).
3. The occurrence flight was the fifth flight of the day for the pilots.
4. During the occurrence flight, the PIC acted as Pilot Flying (PF), and the SIC acted as Pilot Monitoring (PM).
5. During the occurrence flight, the aircraft was operated within the weight and balance envelope.
6. During the occurrence, it was reported that the weather around Poik Airstrip was clear.
7. The aircraft was found impacted into the ridge of the mountain with an elevation of about 5,600 feet on coordinates of 3° 54’ 26.35” S and 139° 25’ 53.08” E. The crash site location is about 9.5 NM from Poik Airstrip on bearing 030° or about 7.5 NM from Elelim Airport on bearing 158°.
8. The aircraft was equipped with CVDR, but the recorder could not be found during the search and rescue activities.
9. The aircraft was equipped with a Garmin G1000, with which the Terrain Awareness Warning System (TAWS) was available. There was no report of TAWS malfunctioning prior to the flight.

3 SAFETY ACTION

At the time of issuing this Preliminary Report, the KNKT had not been informed of any safety actions resulting from this occurrence.

4 SAFETY RECOMMENDATIONS

The safety recommendation in this investigation report is made with the intention of preventing accidents or incidents, which in no case has the purpose of creating a presumption of blame or liability for an accident or incident.

At the time of publishing the Preliminary Report, KNKT had not yet identified any safety issues. Therefore, KNKT did not issue a recommendation.

KOMITE NASIONAL KESELAMATAN TRANSPORTASI REPUBLIK INDONESIA
Jl. Medan Merdeka Timur No.5 Jakarta 10110 INDONESIA
Phone : (021) 351 7606 / 384 7601 Fax : (021) 351 7606 Call Center : 0812 12 655 155
website 1 : http://knkt.dephub.go.id/webknkt/ website 2 : http://knkt.dephub.go.id/knkt/
email : knkt@dephub.go.id